Reservoir Storage Outlook

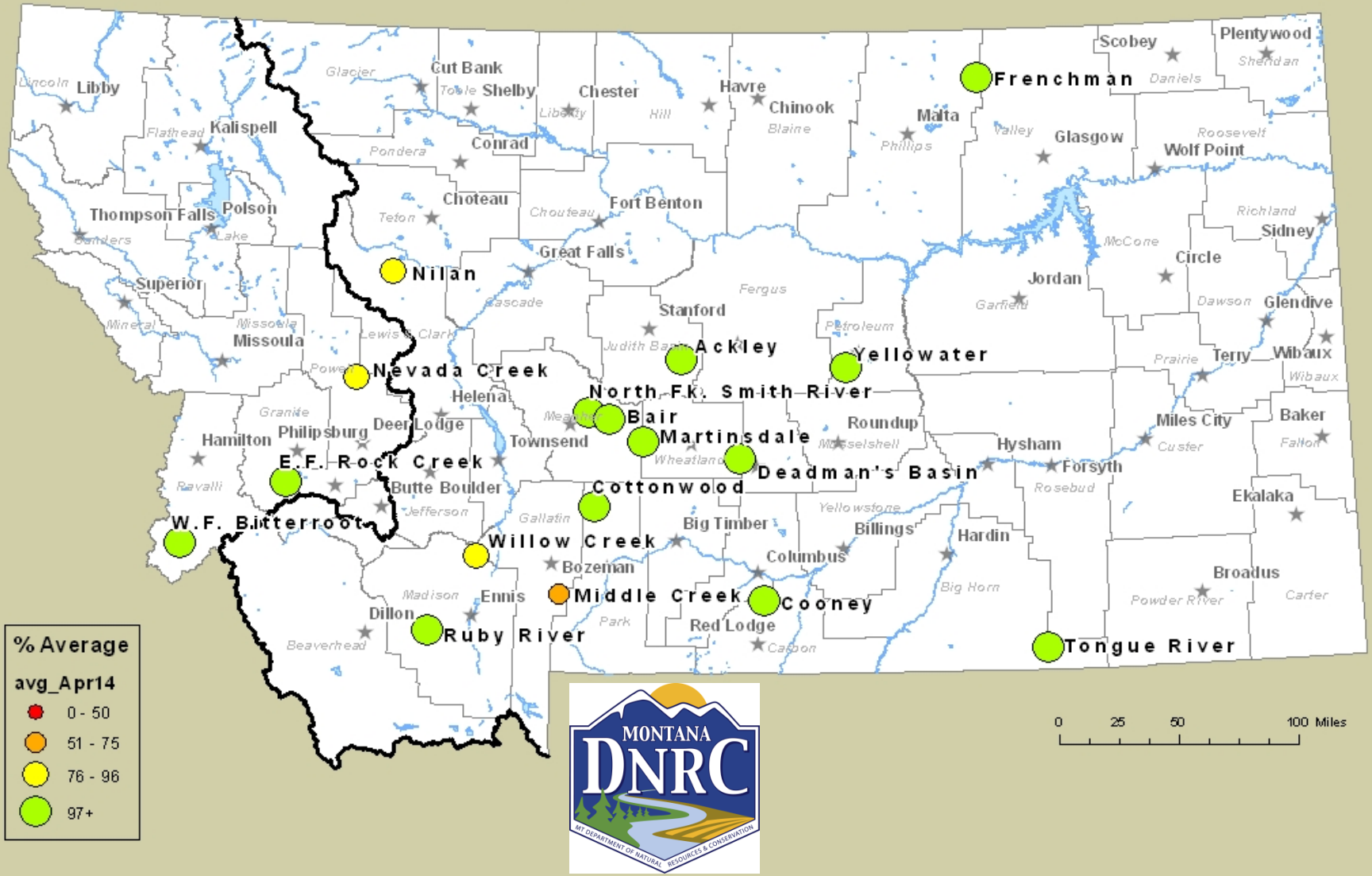
May 15, 2014

DNRC Water Resources Division

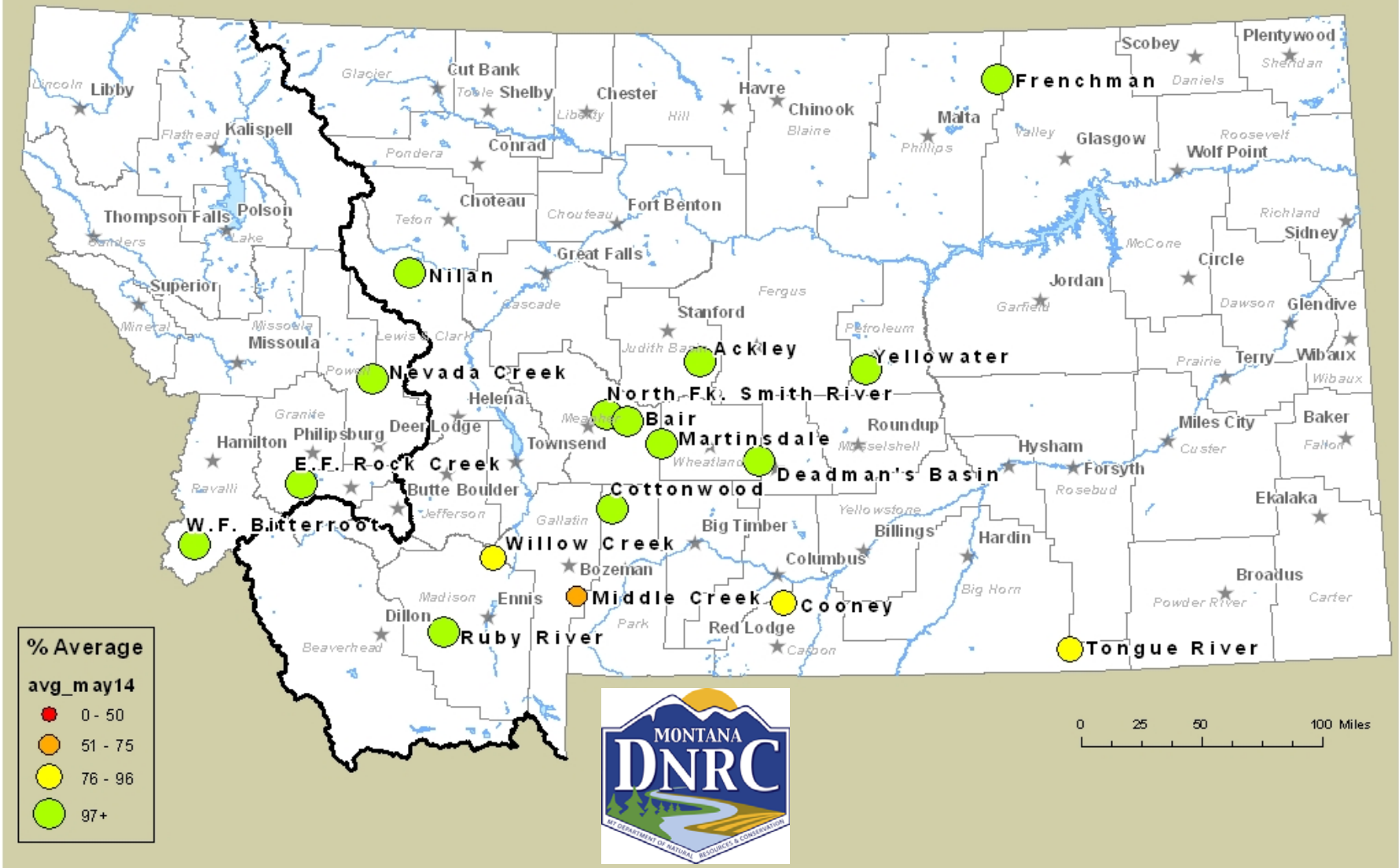
State Water Projects Bureau

Montana DNRC State Water Projects Bureau Reservoirs

Reservoir Contents Report
April 17, 2014



Reservoir Contents Report
May 15, 2014



MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

WATER RESOURCES DIVISION - STATE WATER PROJECTS BUREAU

April 30, 2014

All Contents in Acre-Feet

RESERVOIR	TOTAL CAPACITY (includes dead storage)*	CONTENTS						READING DATE	COMMENTS
	Full Pool	AVERAGE	Last Year	Last Month	PRESENT	% CAPACITY	%AVERAGE		
	Contents	1960 - 2013	4/30/2013	3/31/2014	4/30/2014	4/30/2014	4/30/2014		
ACKLEY	6,722	3,669	2,946	4,153	4,112	61	112	5/1/2014	elev.=4306.8
BAIR	7,300	5,292	4,883	3,773	5,114	70	97	4/30/2014	elev.=5315.99
COONEY	28,230	22,450	20,595	21,461	20,950	74	93	4/29/2014	elev.=4242.0 (20,860 AF)
COTTONWOOD	1,900	1,483	748	1,596	1,981	104	134	4/29/2014	elev.=5102.8
DEADMAN'S BASIN	75,968	53,371	55,870	56,444	69,290	91	130	4/30/2014	elev.=3917.69 (65,540 AF)
E.F. ROCK CREEK	16,040	9,652	10,718	9,720	10,224	64	106	4/30/2014	elev.=6039.2
FRENCHMAN	2,777	2,431	2,777	2,777	2,777	100	114	5/2/2014	spilling
MARTINSDALE	23,348	12,069	7,548	7,344	15,138	65	125	4/30/2014	elev.=4769.87
MIDDLE CREEK	10,184	6,523	5,219	4,499	4,430	43	68	4/30/2014	elev.=6689.9
NEVADA CREEK	11,207	10,011	7,369	6,521	10,402	93	104	4/29/2014	elev.=4613.74
NILAN	10,992	7,124	6,410	6,391	7,920	72	111	4/29/2014	elev.=4436.12 (7,020 AF)
N.FK. SMITH RIVER	11,406	8,746	8,604	8,148	10,732	94	123	4/30/2014	elev.=5486.11
RUBY RIVER	37,612	36,128	36,131	34,501	37,612	100	104	4/30/2014	spilling
TONGUE RIVER	79,071	51,522	58,316	60,558	45,515	58	88	4/30/2014	elev.=3417.7
W.F. BITTERROOT	32,362	19,972	23,000	14,125	29,937	93	150	4/29/2014	elev.=4721.5
WILLOW CREEK	18,000	17,271	14,813	16,183	14,033	78	81	4/22/2014	elev.=4731.0
YELLOWATER	3,842	1,356	1,681	3,496	3,431	89	253	5/1/2014	elev.=3117.5

* Note: Reservoir contents include dead storage at the following:

Ackley	1001 AF	**	Tongue River	711 AF	(O&M storage table includes dead storage)
Cooney	90 AF	**	W. F. Bitterroot	656 AF	(O&M storage table includes dead storage)
Deadman's	3750 AF	**	Willow Creek	269 AF	(O&M storage table includes dead storage)
Nilan	900 AF	**			

** O&M slope storage table does not include dead storage (so dead storage has to be added into the storage from the table)

* Note: Cooney capacity reflects capacity after 1982 dam rehabilitation; prior capacity was 24,195 A.F.. Average storage shown is for post rehabilitation data.

* Note: Middle Creek capacity reflects capacity after 1993 dam rehabilitation; prior capacity was 8,027 A.F.. Average storage shown is for post rehabilitation data.

* Note: Nevada Creek Reservoir Capacity reflects live storage capacity survey conducted in year 2000. Prior live storage capacity documented as 12,723 AF.

* Note: Tongue River capacity reflects capacity after 1999 dam rehabilitation; prior capacity was 68,040 A.F.. Average storage is post rehabilitation data.

* Note: Frenchman Reservoir capacity tables updated based on aerial survey; prior capacity was 3752 A.F. Average shown is pre aerial survey

MONTANA SNOTEL Snow Water Equivalent Update Graph

As of WEDNESDAY: APRIL 16 , 2014

Basin	Snow Water Equivalent Percent of Median
KOOTENAI RIVER BASIN	116%
FLATHEAD RIVER BASIN	129%
UPPER CLARK FORK RIVER BASIN	142%
BITTERROOT RIVER BASIN	*
LOWER CLARK FORK RIVER BASIN	143%
JEFFERSON RIVER BASIN	*
MADISON RIVER BASIN	*
GALLATIN RIVER BASIN	*
MISSOURI HEADWATERS	*
HEADWATERS MISSOURI MAINSTEM	165%
SMITH, JUDITH, AND MUSSELSHELL RIVER BASINS	156%
SUN, TETON AND MARIAS RIVER BASINS	151%
MISSOURI MAINSTEM RIVER BASIN	157%
ST MARY AND MILK RIVER BASINS	132%
UPPER YELLOWSTONE RIVER BASIN	157%
WIND RIVER BASIN (WYOMING)	121%
SHOSHONE RIVER BASIN (WYOMING)	150%
BIGHORN RIVER BASIN (WYOMING)	153%
TONGUE RIVER BASIN (WYOMING)	150%
POWDER RIVER BASIN (WYOMING)	163%
LOWER YELLOWSTONE RIVER BASIN	143%

Legend:	<70%	70-90%	91-110%	111-130%	>130%

* = Data are not available or data may not provide a valid measure of conditions for over half of the sites within the basin.

MONTANA SNOTEL Snow Water Equivalent Update Graph

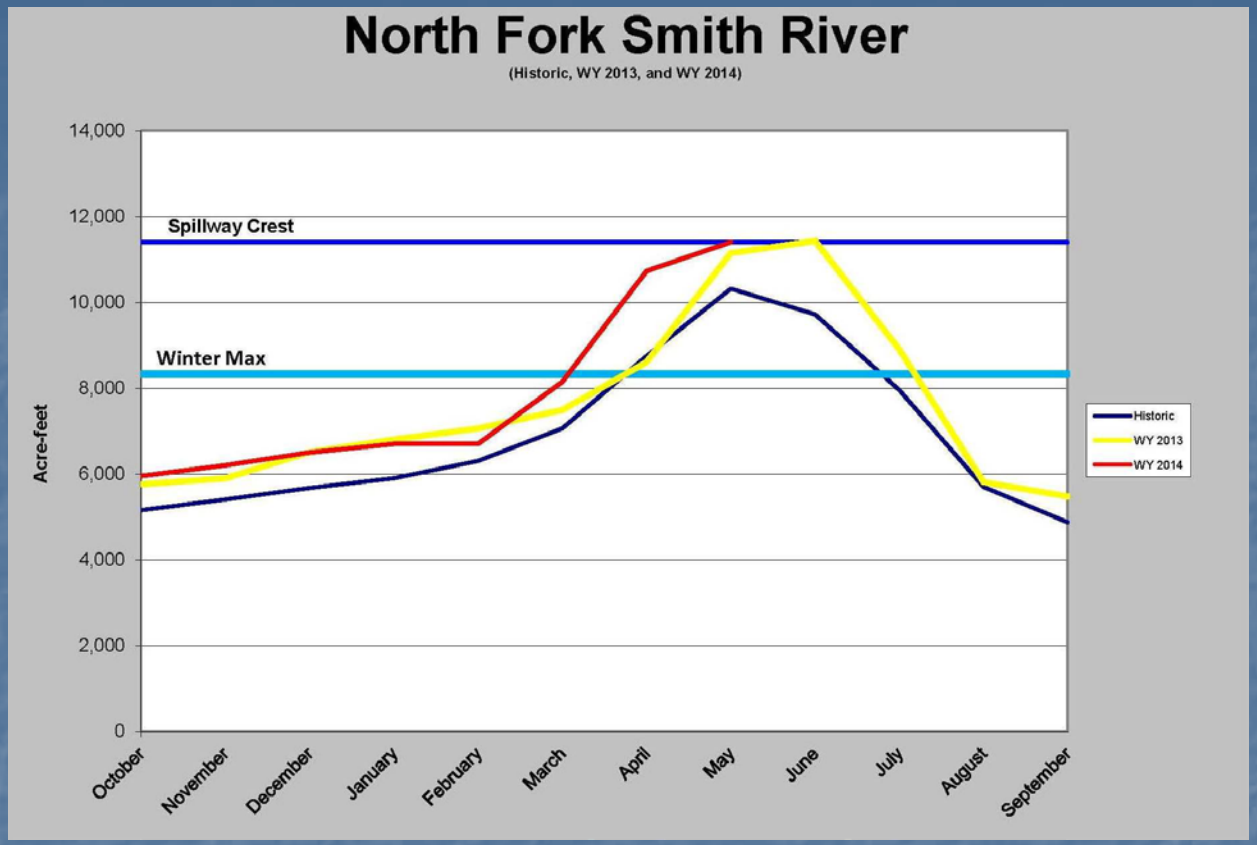
As of WEDNESDAY: MAY 14 , 2014

Basin	Snow Water Equivalent Percent of Median
KOOTENAI RIVER BASIN	146%
FLATHEAD RIVER BASIN	146%
UPPER CLARK FORK RIVER BASIN	158%
BITTERROOT RIVER BASIN	210%
LOWER CLARK FORK RIVER BASIN	171%
JEFFERSON RIVER BASIN	146%
MADISON RIVER BASIN	136%
GALLATIN RIVER BASIN	162%
MISSOURI HEADWATERS	147%
HEADWATERS MISSOURI MAINSTEM	154%
SMITH, JUDITH, AND MUSSELSHELL RIVER BASINS	170%
SUN, TETON AND MARIAS RIVER BASINS	216%
MISSOURI MAINSTEM RIVER BASIN	184%
ST MARY AND MILK RIVER BASINS	139*%
UPPER YELLOWSTONE RIVER BASIN	162%
WIND RIVER BASIN (WYOMING)	142%
SHOSHONE RIVER BASIN (WYOMING)	151%
BIGHORN RIVER BASIN (WYOMING)	156%
TONGUE RIVER BASIN (WYOMING)	162%
POWDER RIVER BASIN (WYOMING)	173%
LOWER YELLOWSTONE RIVER BASIN	153%

Legend:	<70%	70-90%	91-110%	111-130%	>130%

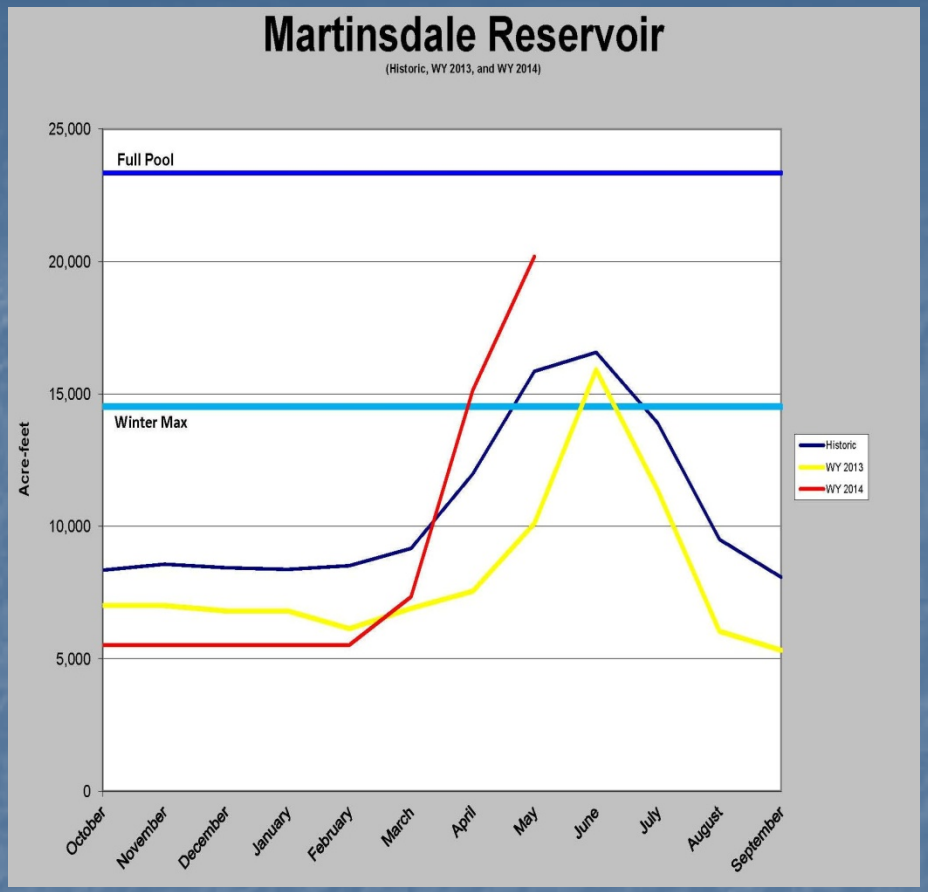
* = Data are not available or data may not provide a valid measure of conditions for over half of the sites within the basin.

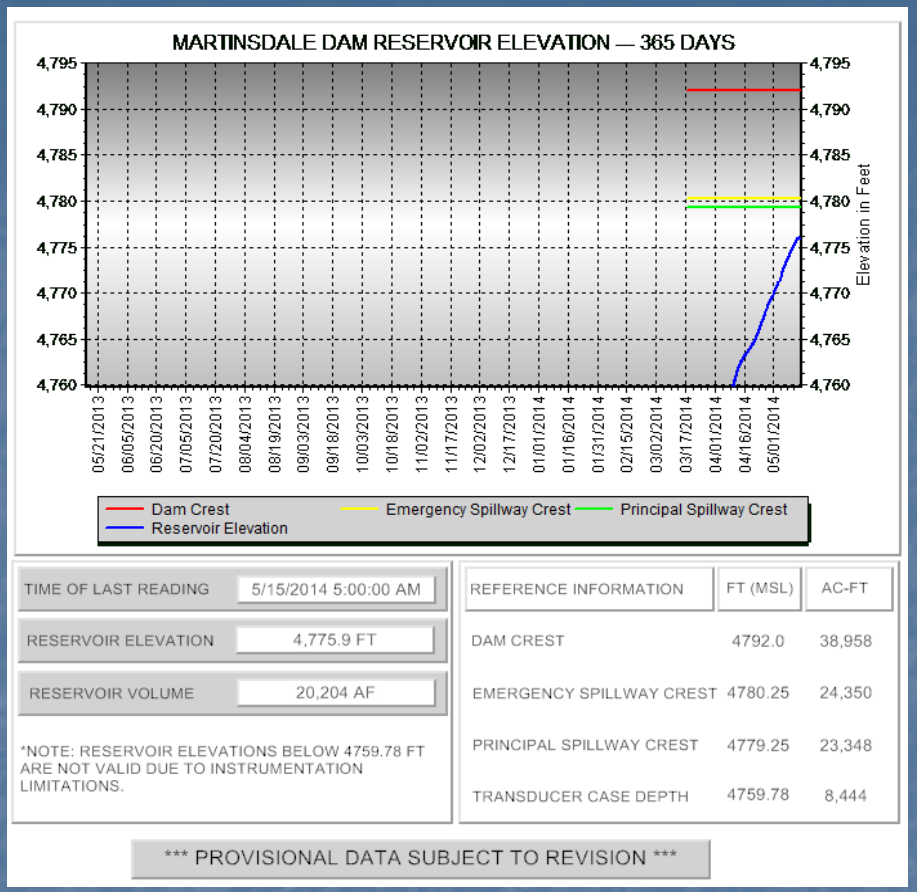
Montana DNRC State Water Projects Bureau Reservoirs



- 100% Capacity
- 11,406 Acre-Feet
- Reservoir is spilling
- Water Supply is favorable

Montana DNRC State Water Projects Bureau
Reservoirs





TIME OF LAST READING	5/15/2014 5:00:00 AM
RESERVOIR ELEVATION	4,775.9 FT
RESERVOIR VOLUME	20,204 AF

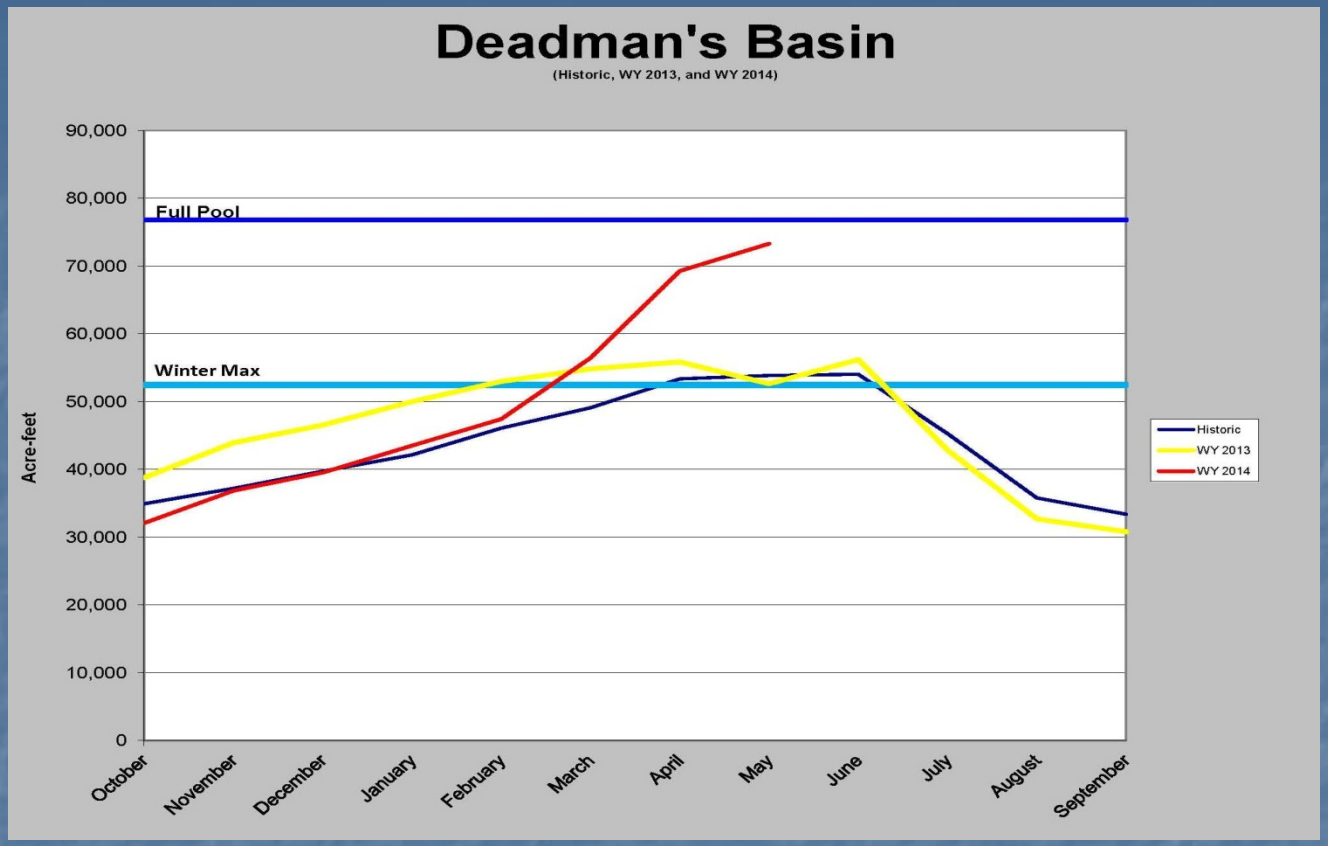
*NOTE: RESERVOIR ELEVATIONS BELOW 4759.78 FT ARE NOT VALID DUE TO INSTRUMENTATION LIMITATIONS.

REFERENCE INFORMATION	FT (MSL)	AC-FT
DAM CREST	4792.0	38,958
EMERGENCY SPILLWAY CREST	4780.25	24,350
PRINCIPAL SPILLWAY CREST	4779.25	23,348
TRANSDUCER CASE DEPTH	4759.78	8,444

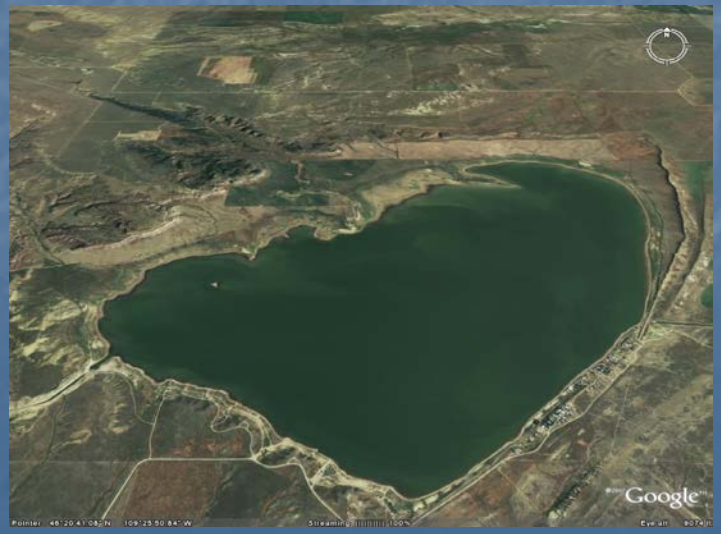
*** PROVISIONAL DATA SUBJECT TO REVISION ***

- 86% Capacity
- 20,186 Acre-Feet
- Elev.=4,775.9
- Inflows=0 cfs
- Outflows=0 cfs
- Water Supply is favorable

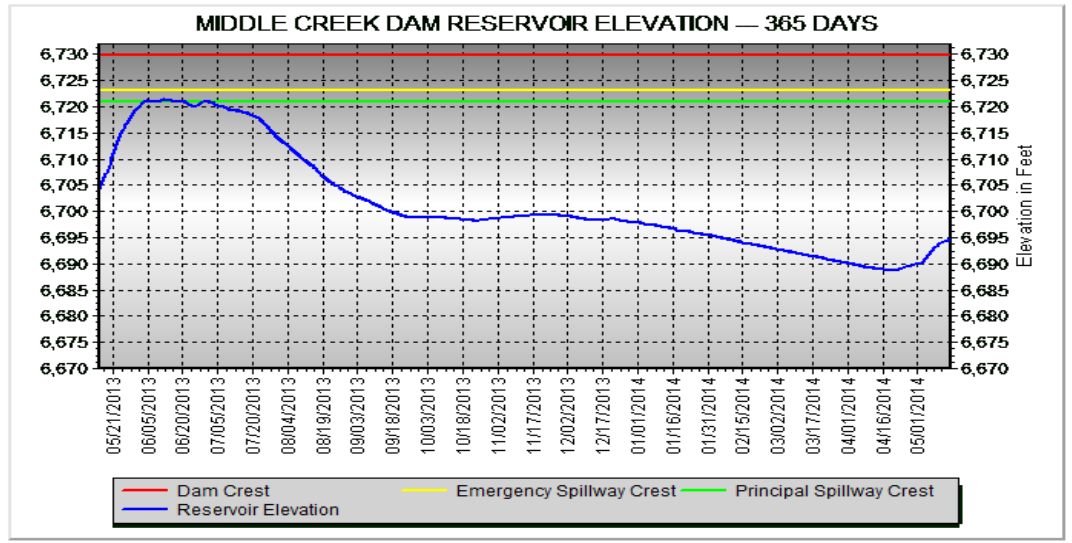
Montana DNRC State Water Projects Bureau Reservoirs



- 97% Capacity
- 73,311 Acre-Feet
- Elev.=3919.7
- Inflow~130 cfs
- Water Supply is favorable



Montana DNRC State Water Projects Bureau Reservoirs

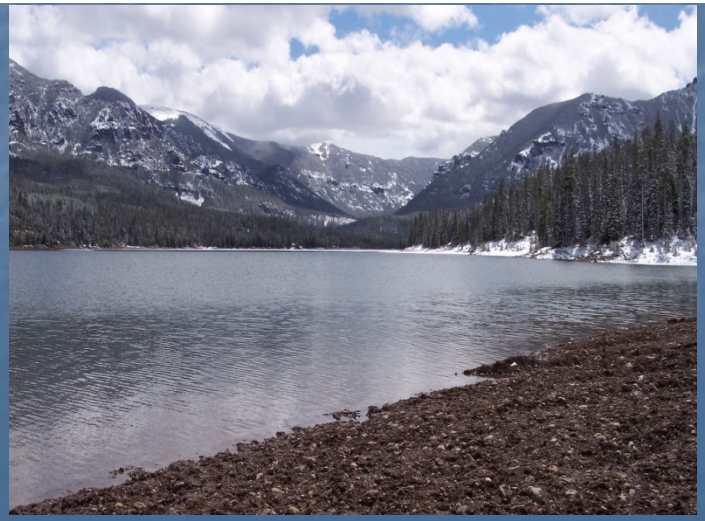


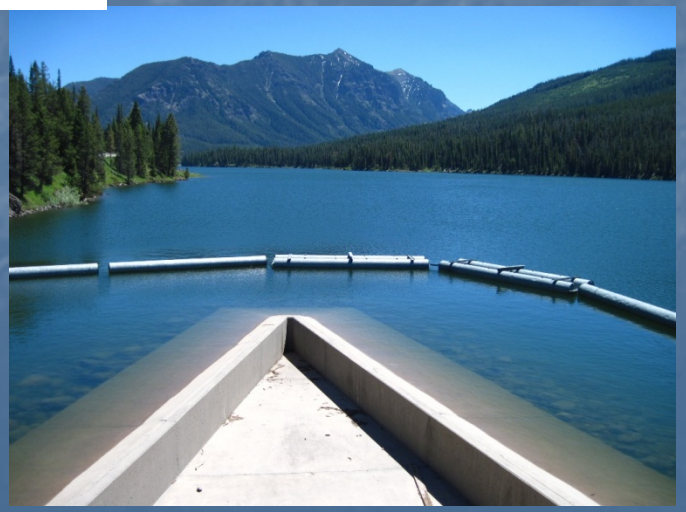
TIME OF LAST READING	5/15/2014 5:00:00 AM
RESERVOIR ELEVATION	6,694.3 FT
RESERVOIR VOLUME	5,066 AF
MIDDLE CREEK BELOW DAM	**ICE**
TIME OF LAST READING	5/15/2014 5:45:00 AM

REFERENCE INFORMATION	FT (MSL)	AC-FT
DAM CREST	6730.0	12,790
EMERGENCY SPILLWAY CREST	6723.0	10,707
PRINCIPAL SPILLWAY CREST	6721.0	10,184
LOWEST USABLE ELEVATION	6637.0	0

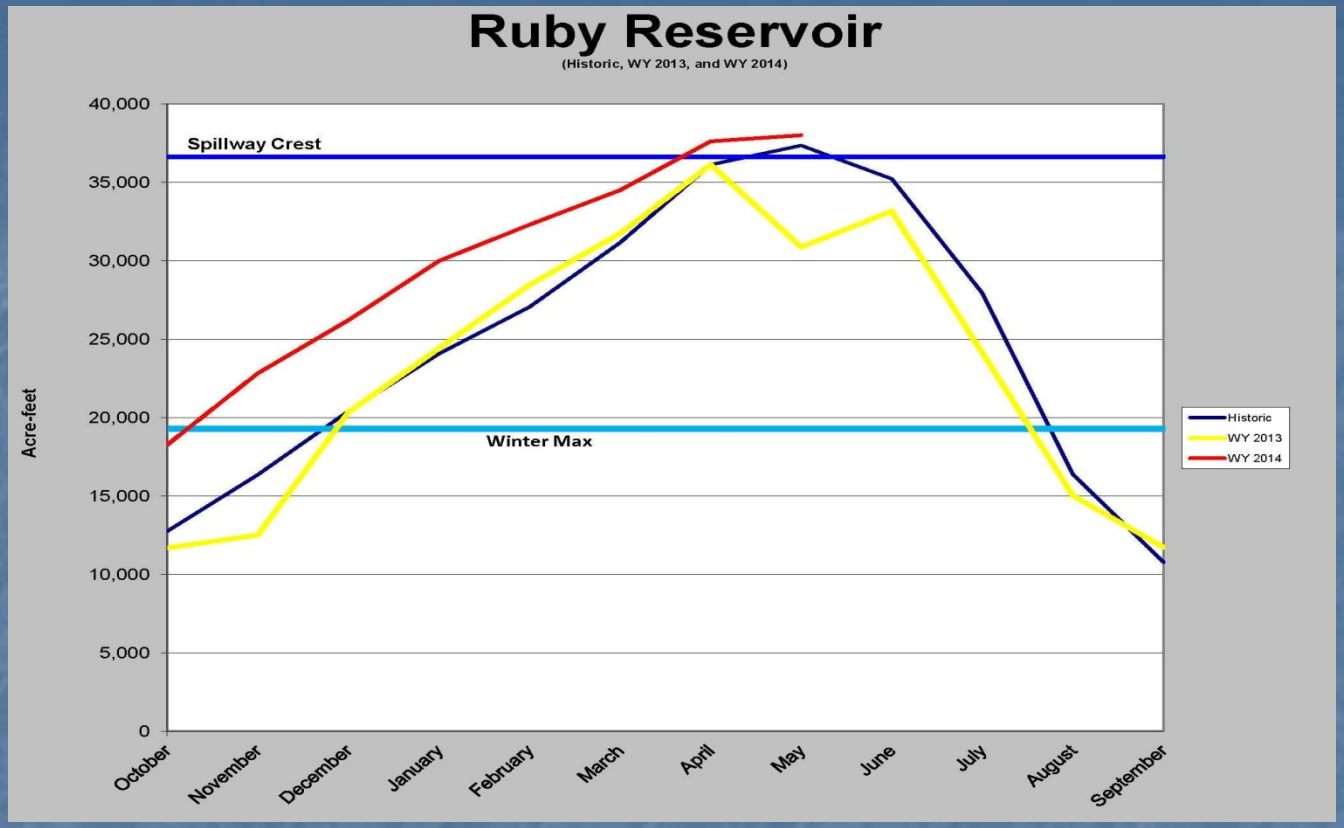
*** PROVISIONAL DATA SUBJECT TO REVISION ***

- 50% Capacity
- Outflows~15 cfs
- 5,074 Acre-Feet
- Elev.=6694.3
- Water Supply is favorable



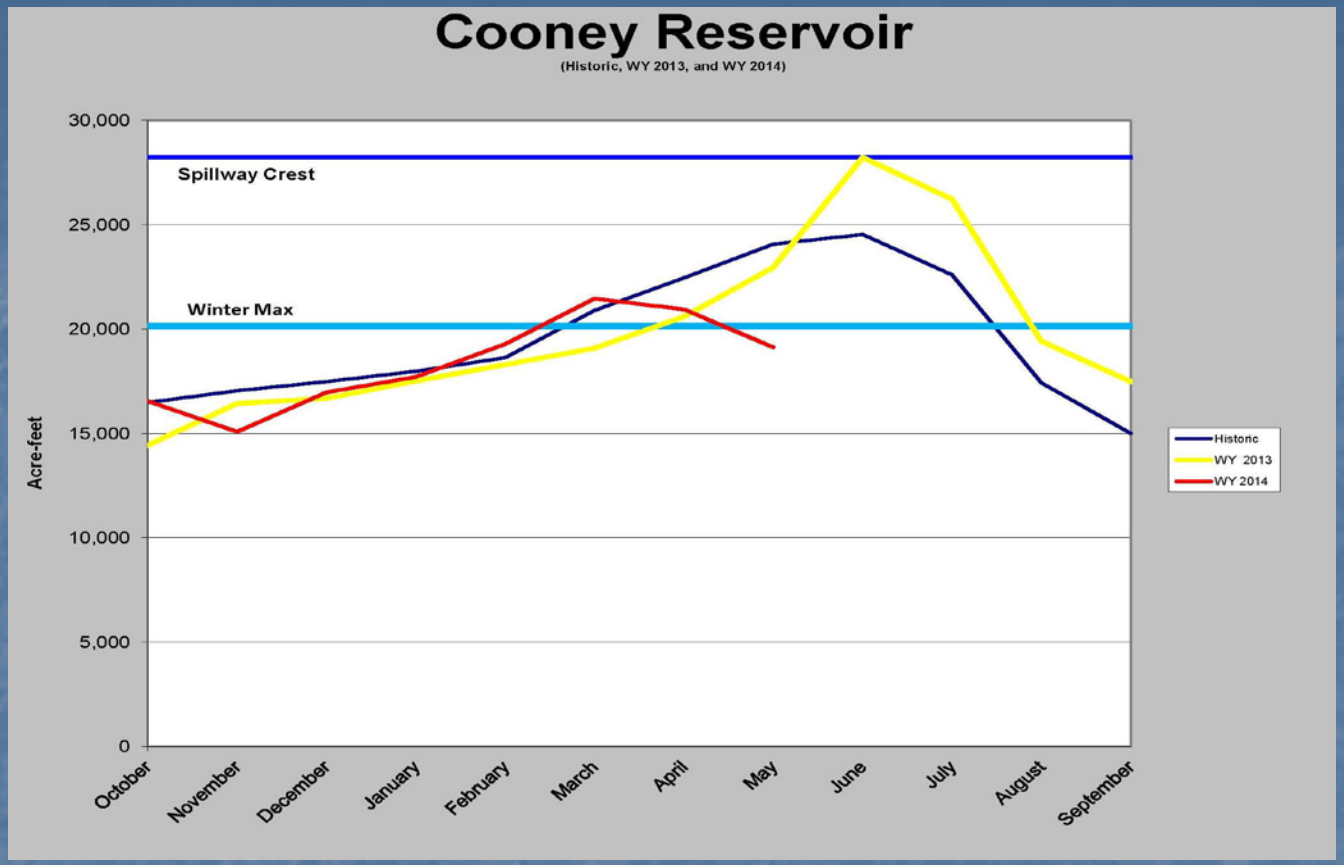


Montana DNRC State Water Projects Bureau Reservoirs



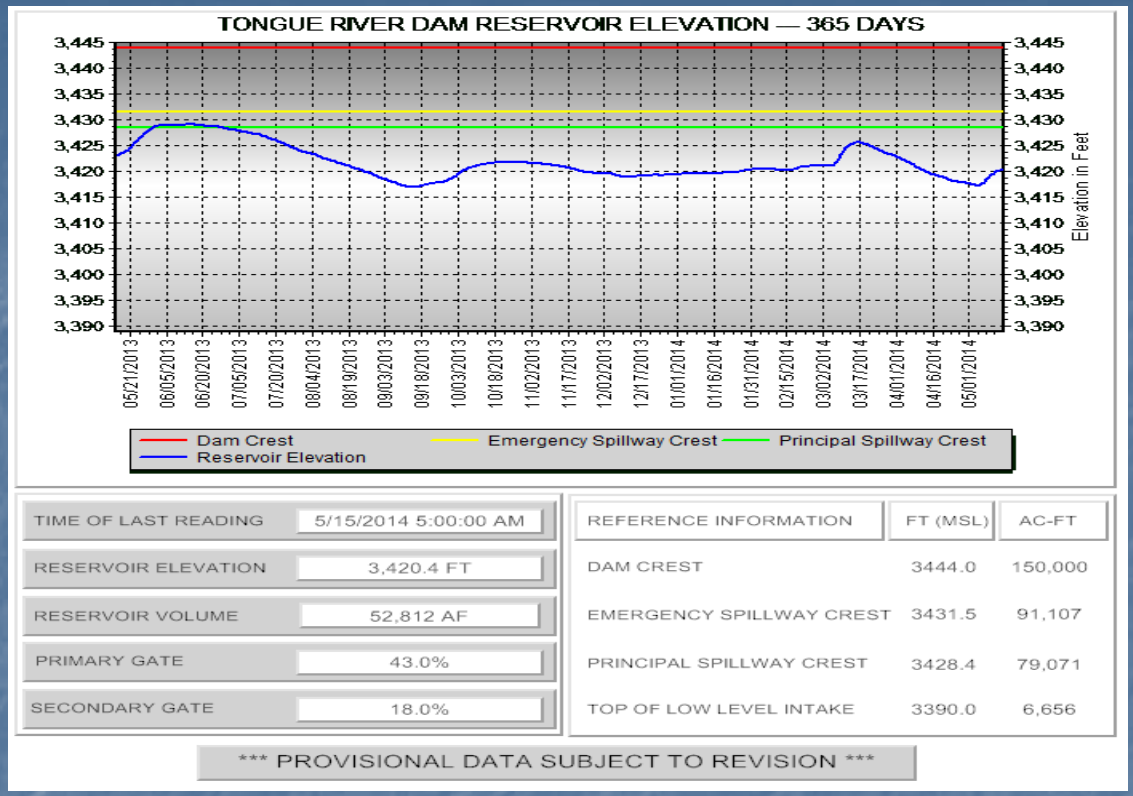
- 100% Capacity
- 38,006 Acre-Feet
- Elev.=5393.36
- Inflows=183 cfs
- Outflows=250 cfs
- Water Supply is favorable

Montana DNRC State Water Projects Bureau Reservoirs



- 68% Capacity
- 19,130 Acre-Feet
- Elev.=4239.5
- Inflows= 278 cfs
- Outflows=428 cfs
- Water Supply is favorable

Montana DNRC State Water Projects Bureau Reservoirs



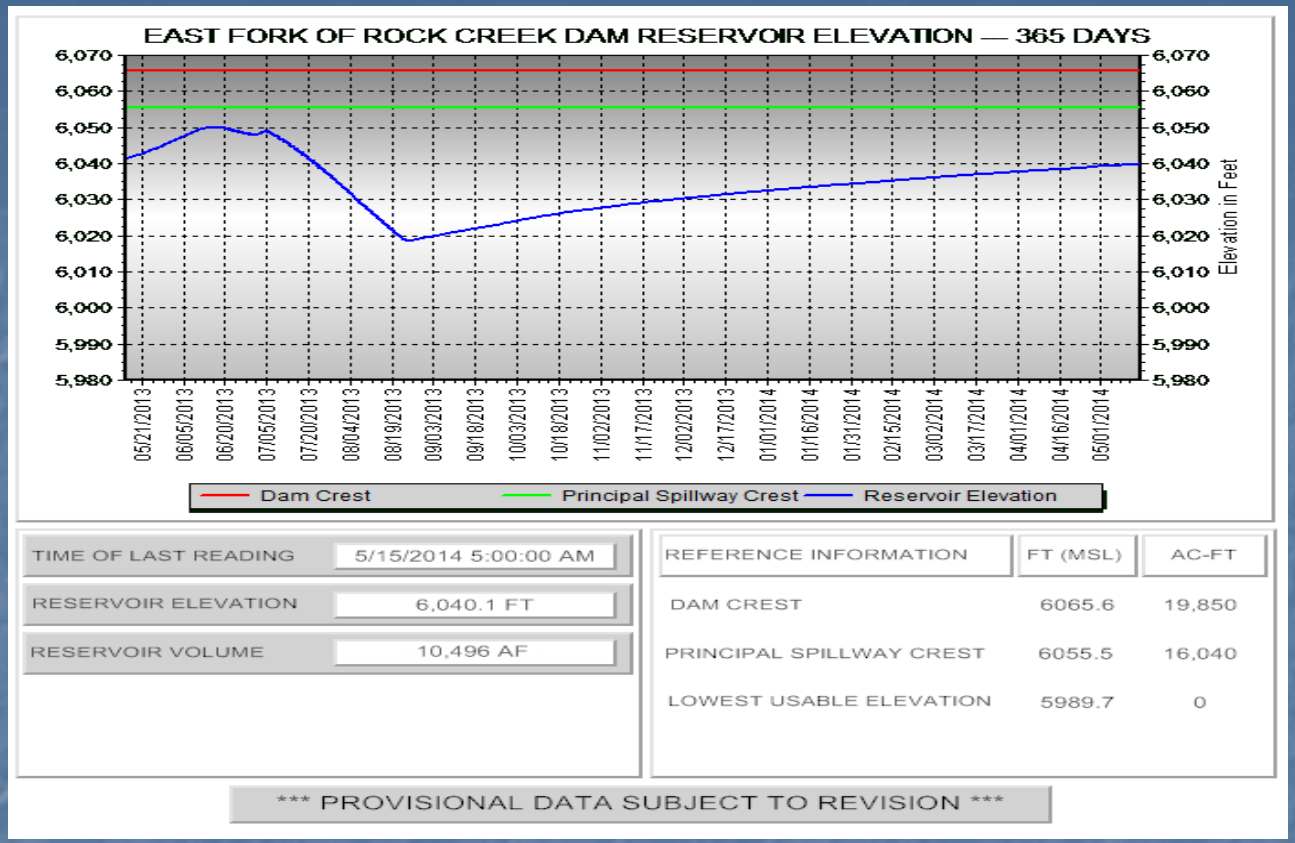
TIME OF LAST READING	5/15/2014 5:00:00 AM
RESERVOIR ELEVATION	3,420.4 FT
RESERVOIR VOLUME	52,812 AF
PRIMARY GATE	43.0%
SECONDARY GATE	18.0%

REFERENCE INFORMATION	FT (MSL)	AC-FT
DAM CREST	3444.0	150,000
EMERGENCY SPILLWAY CREST	3431.5	91,107
PRINCIPAL SPILLWAY CREST	3428.4	79,071
TOP OF LOW LEVEL INTAKE	3390.0	6,656

*** PROVISIONAL DATA SUBJECT TO REVISION ***

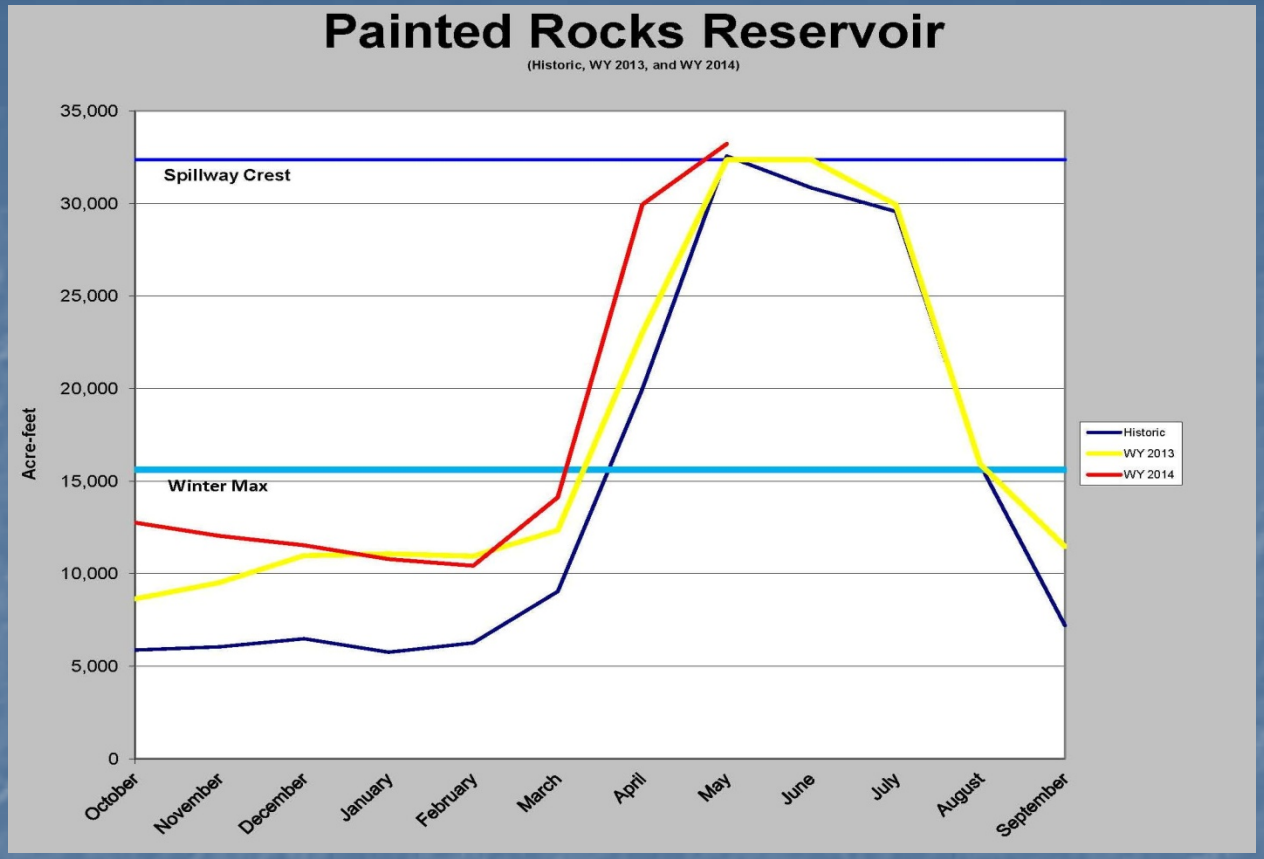
- 66% Capacity
- 52,417 Acre-Feet
- Elev.=3420.3
- Inflows=806 cfs
- Outflows=695 cfs
- Water Supply is favorable

Montana DNRC State Water Projects Bureau Reservoirs



- 65% Capacity
- 10,448 Acre-Feet
- Elev.=6039.9
- Water Supply is favorable

Montana DNRC State Water Projects Bureau Reservoirs



- 100% Capacity
- 33,200 Acre-Feet
- Elev.=4726.17
- Reservoir is spilling
- Inflows/Outflows=1,050 cfs
- Water Supply is favorable

Summary

- Snowpack for SWP reservoirs above average to well above average
- Off-stream reservoirs actively storing runoff
- Water Supply is favorable for DNRC SWP reservoirs and water users should expect full contracted deliveries through WY 2014
- Four (4) DNRC SWP reservoirs currently spilling
- Water Users Associations in conjunction with DNRC SWP have increased discharges at select reservoirs to draft storage levels.
- DNRC SWP reservoirs are not operated as Flood Control Facilities but drafting select reservoirs can potentially mitigate downstream effects.

Broadwater Spillway Rubber Gate Replacement

Toston Dam

- Bay 6 Gate Failure- September 2012
- 2012-2013 Engineering Design
- 2013-2014 Procuremement of Gates/Bulkheads
- 2014 Construction/Installation Bulkheads/Needle beams and Rubber Gates
- Project Cost~$2.5 M

Montana Drought and Water Supply Status by County

Change from April to May 2014 – Assessed 5/7/2014

(All changes one category)

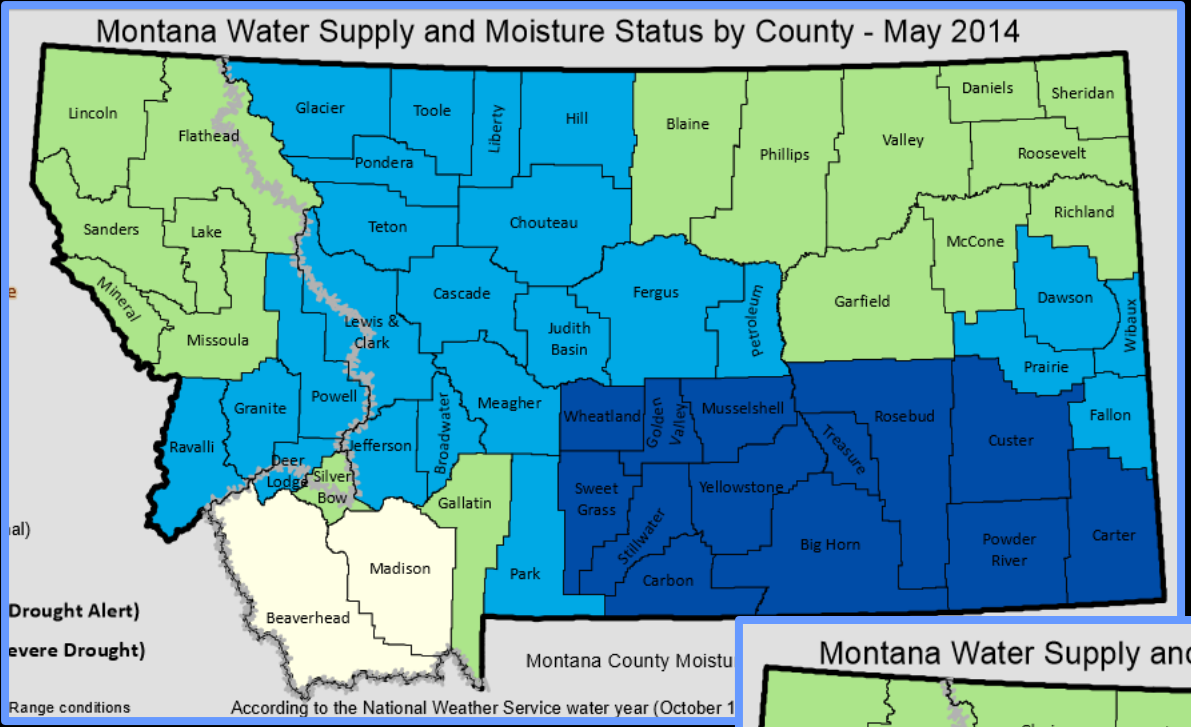
Wetter	Drier
Glacier	Garfield
Pondera	
Toole	
Daniels	
Sheridan	
Roosevelt	

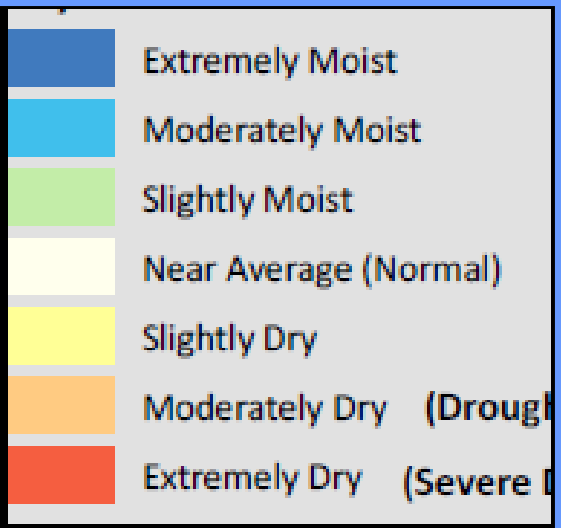
Montana Drought Status

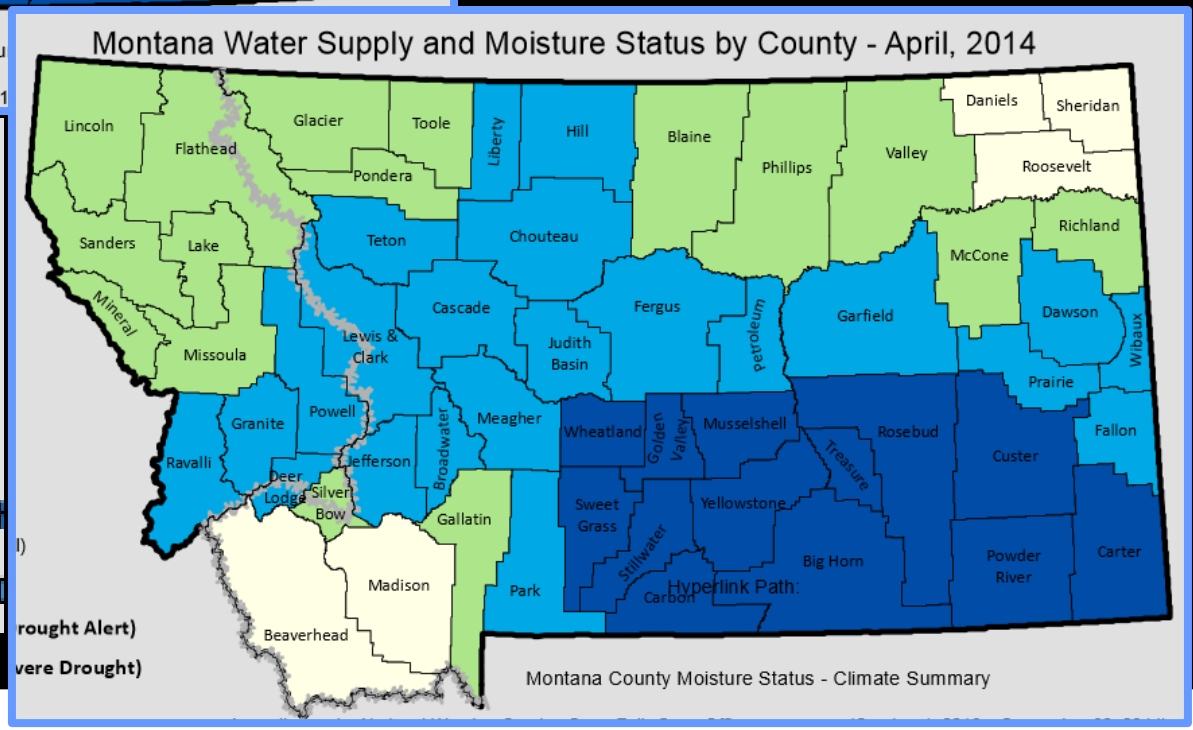
May 2014

vs.

April 2014







NOAA - National Weather Service

Montana
Drought & Water Supply Advisory Committee

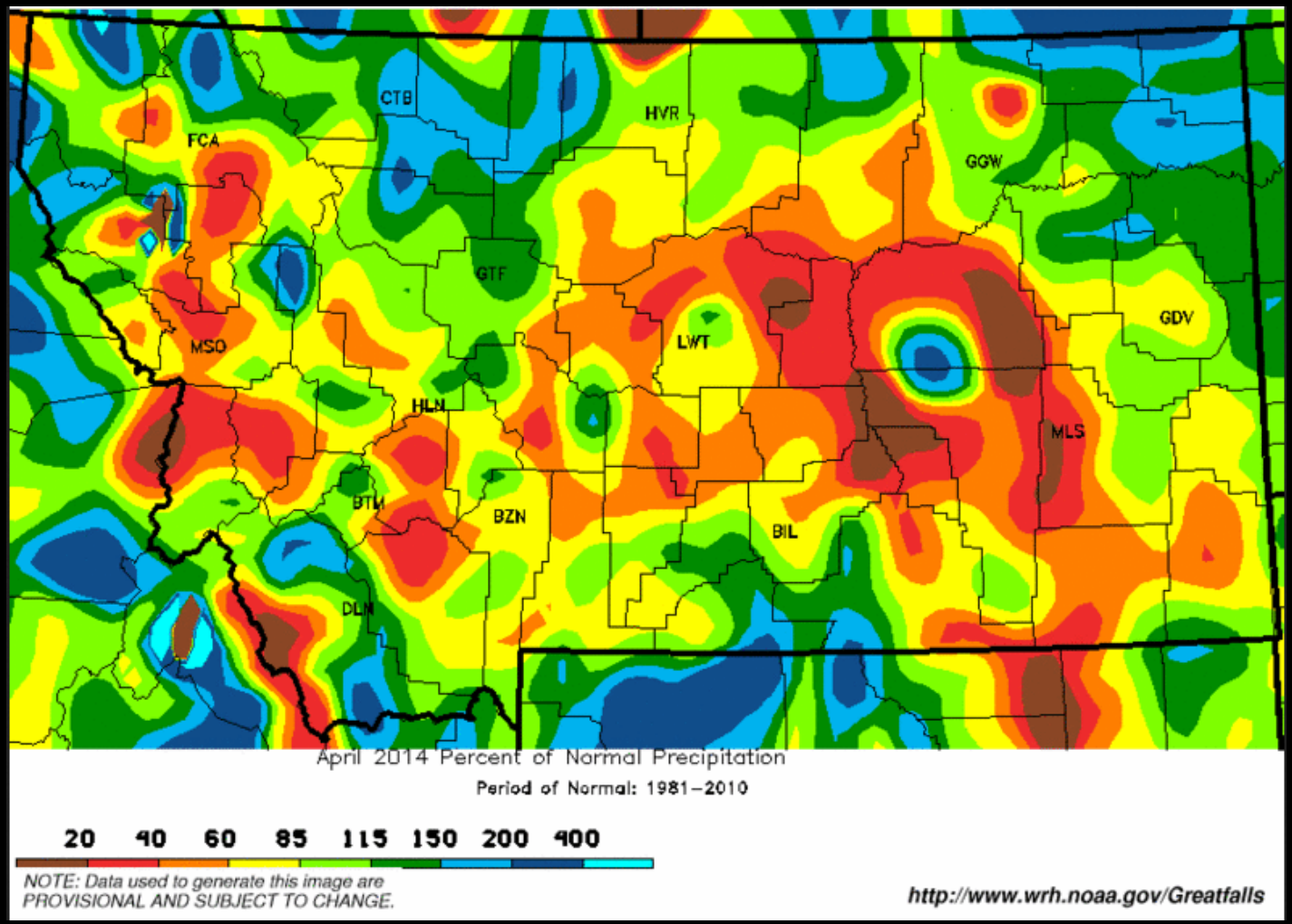
May 15, 2014

National Weather Service

Gina Loss – Service Hydrologist

Percent of Normal Precipitation

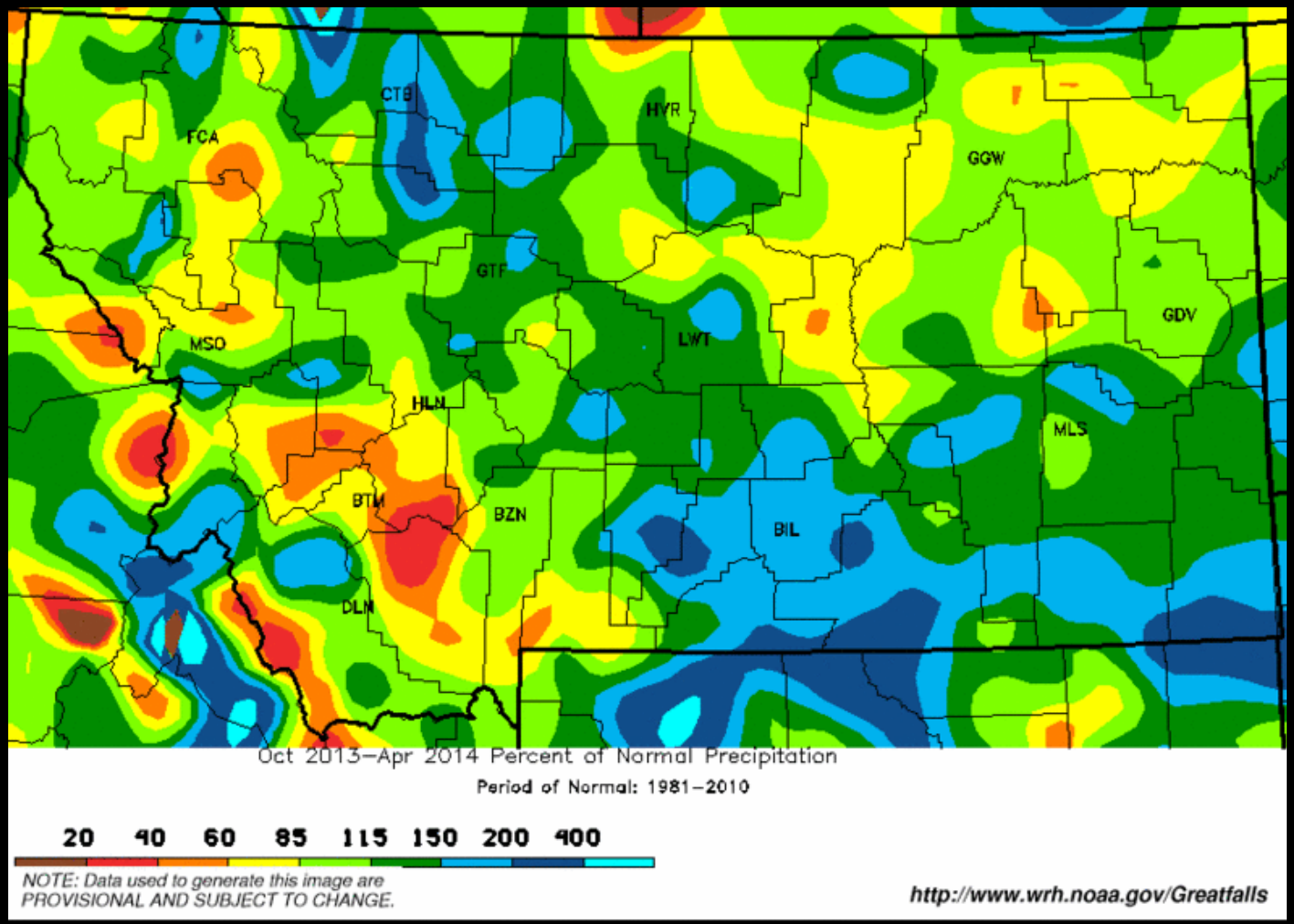
April 2014



- Widespread areas below to well below normal west and east of the Continental Divide
- Smaller areas above to well above normal
  - Mainly hi-line and south-central

Percent of Normal Precipitation

Water Year 2014

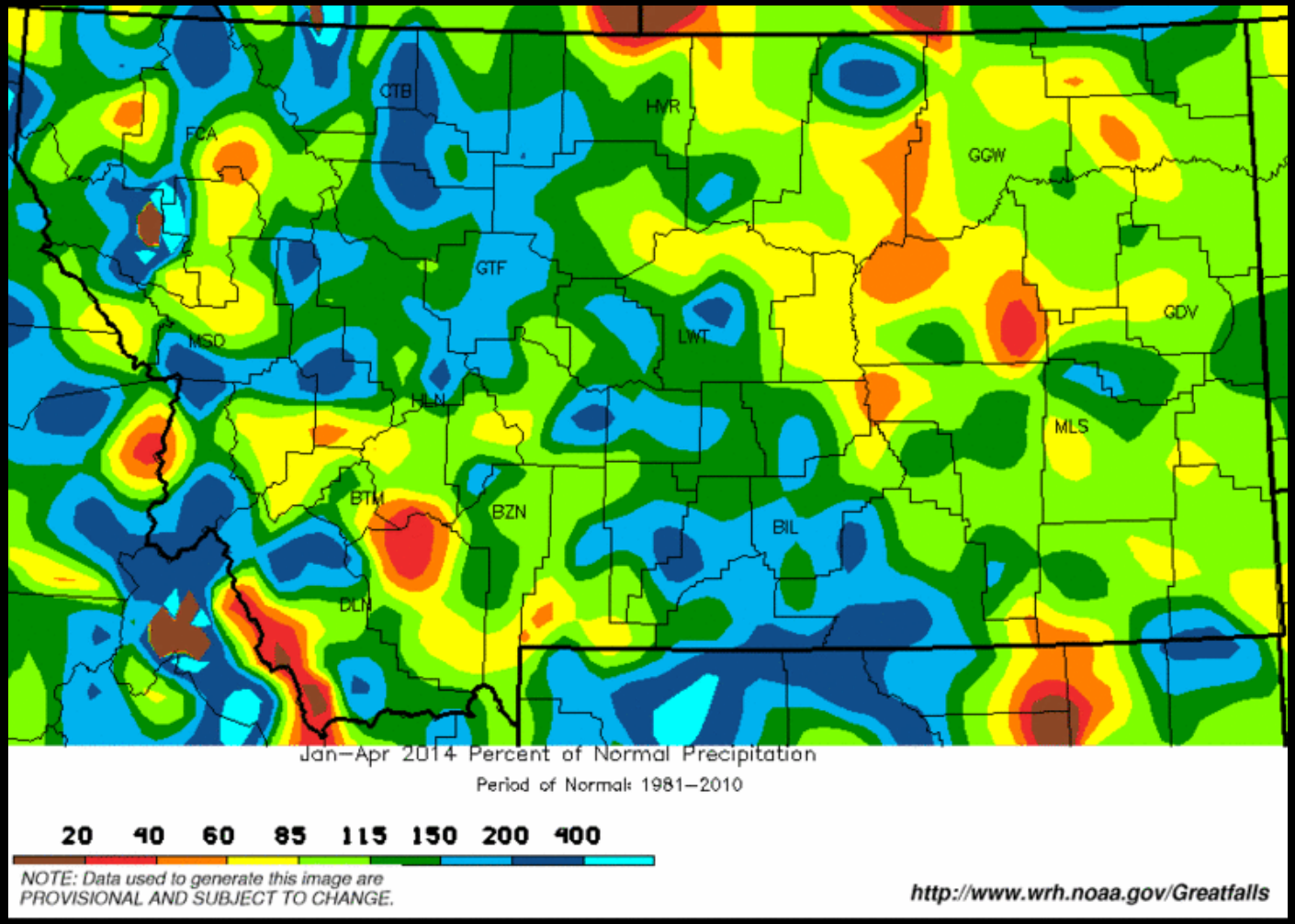


- October - April
- Below to well below normal portions of west, southwest, north-central and northeast
- Above to well above normal along RMF into south-central and southeast

NOAA - National Weather Service

Percent of Normal Precipitation

Calendar Year



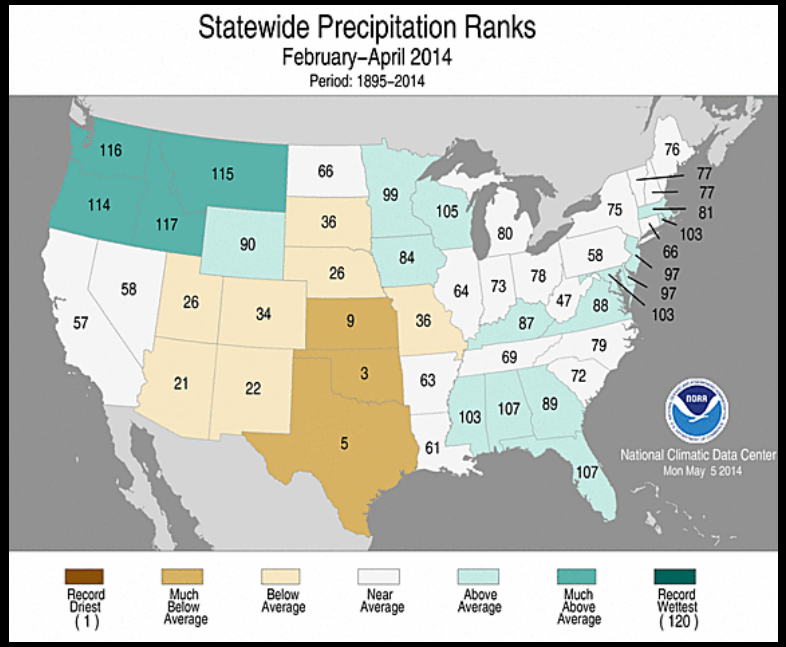
- January - April
- Below to well below normal southwest and northeast
- Above to well above normal west, north-central, central, south-central and southeast

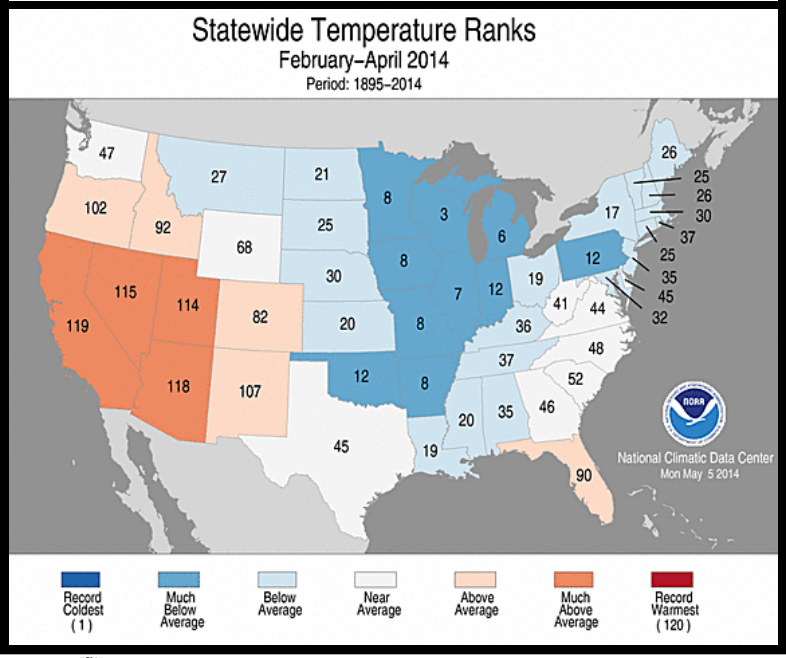
NOAA - National Weather Service

Temperature/Precipitation Rankings

February - April

6th wettest, 27th coldest

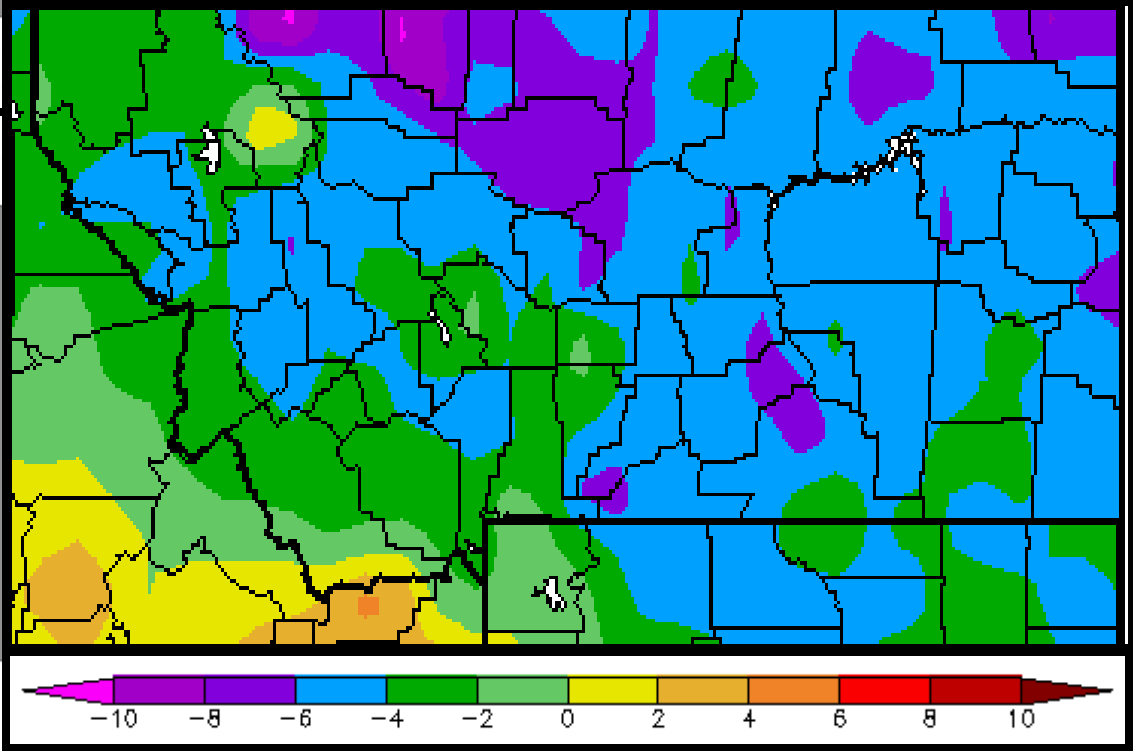




Temperatures

2 to 6 degrees below normal west - southwest

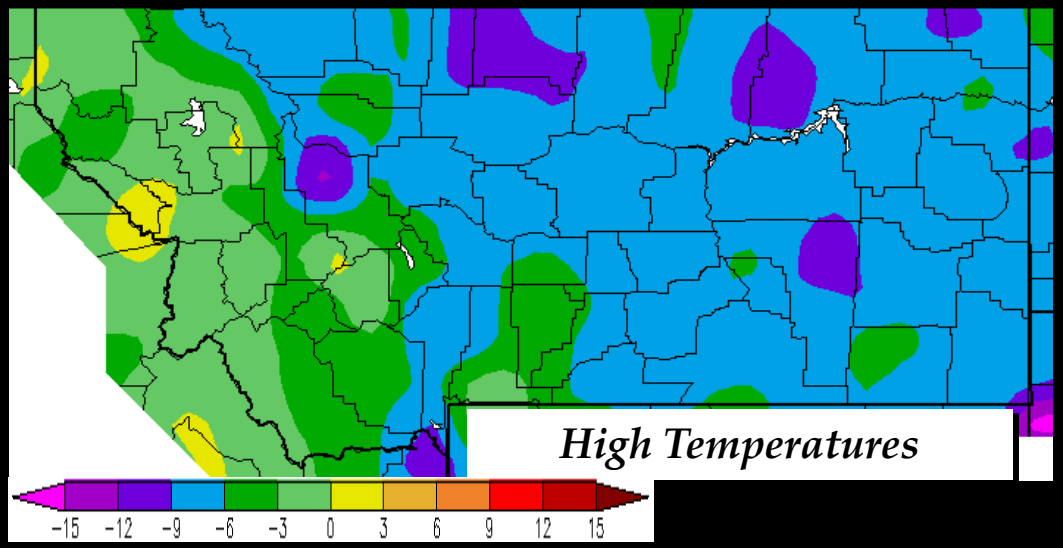
4 to 8 degrees below normal central - east

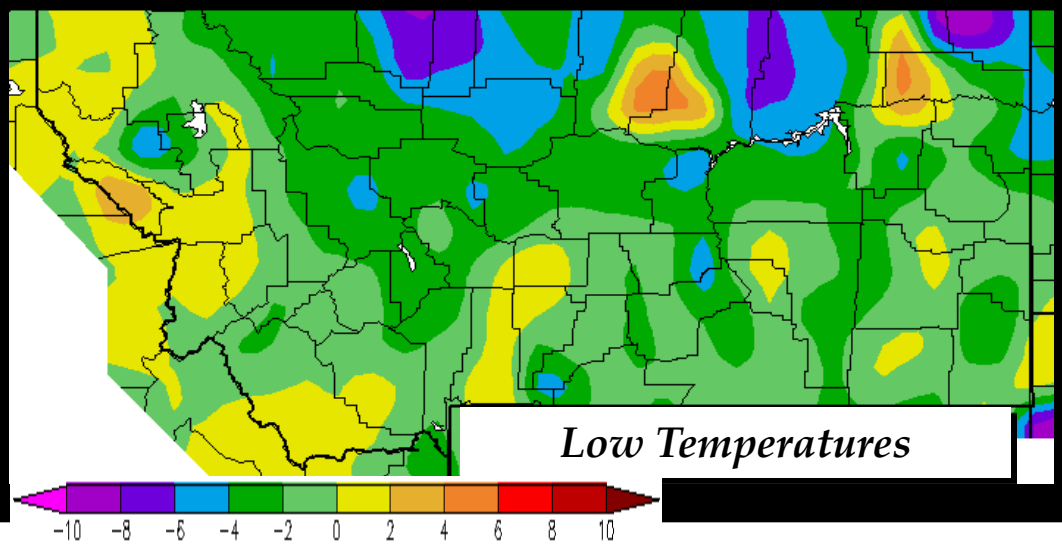


NOAA - National Weather Service

Temperature Anomalies

May 1–12



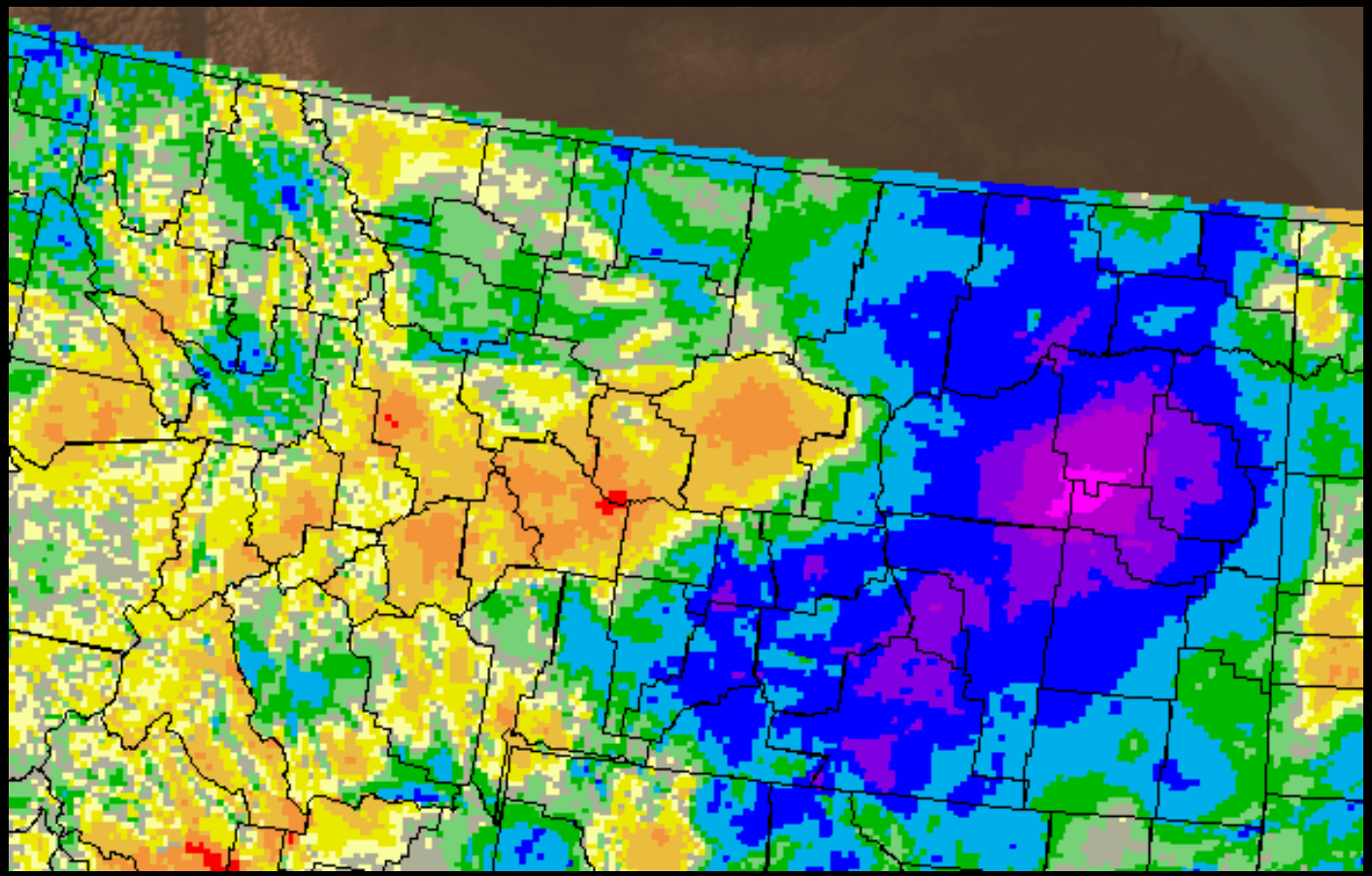


- Highs
  - Near to 6 degrees below normal west and southwest
  - 6 to 12 degrees below normal central and east
- Lows
  - Near normal west, southwest, south-central, southeast
  - 2 to 8 degrees below normal north-central and northeast

NOAA - National Weather Service

Percent of Average Precipitation

May 1–13

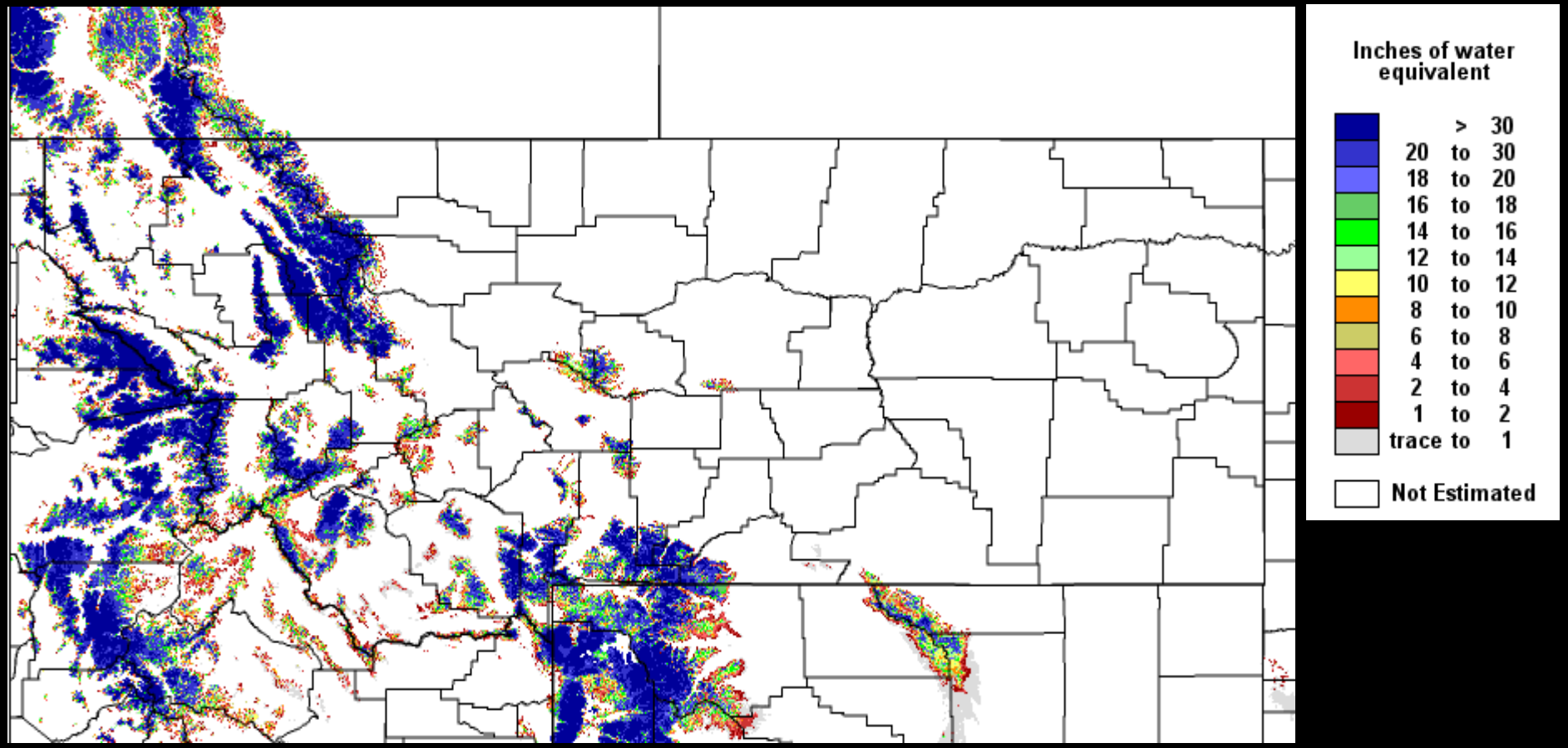


- Below to well below normal large areas of western half
- Above to well above normal eastern half

NOAA - National Weather Service

NOHRSC Modeled Snow Water Equivalent

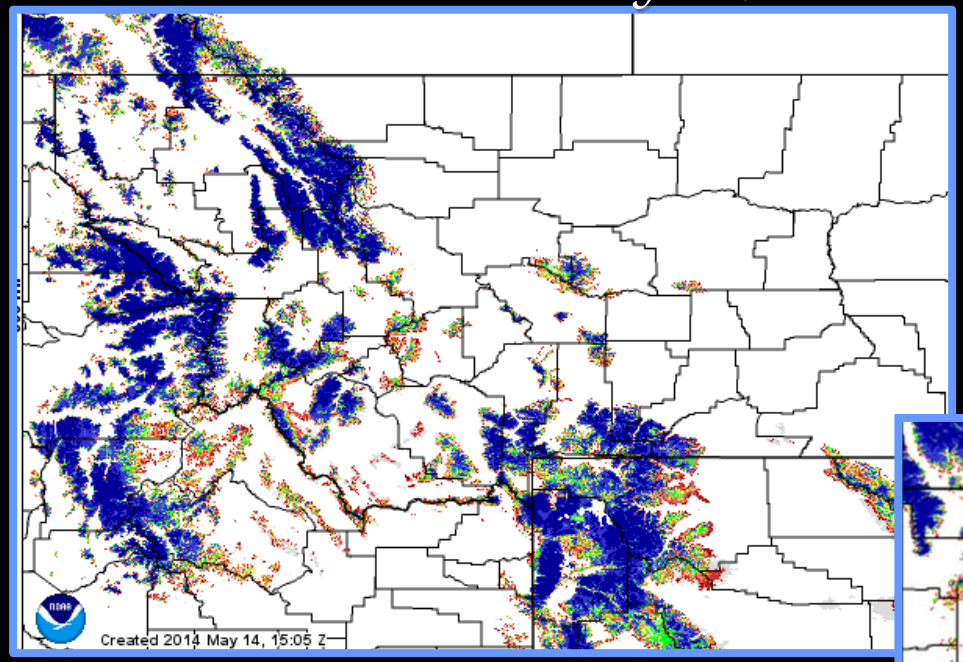
May 15, 2014



NOAA - National Weather Service

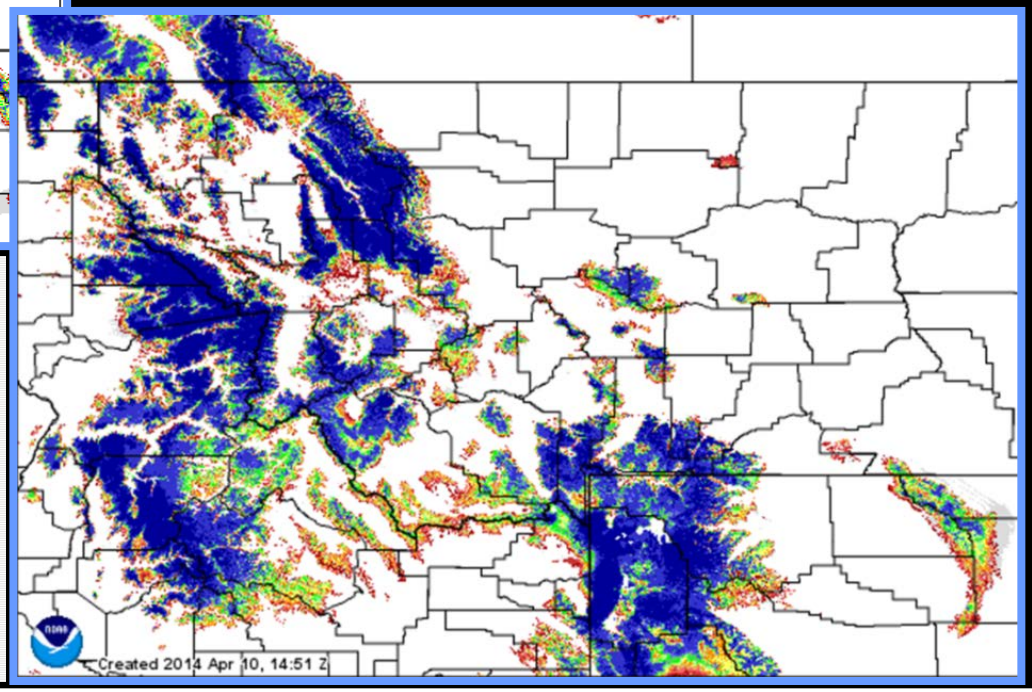
NOHRSC Modeled Snow Water Equivalent

May 14, 2014 vs April 10, 2014



May 15, 2014

April 10, 2014



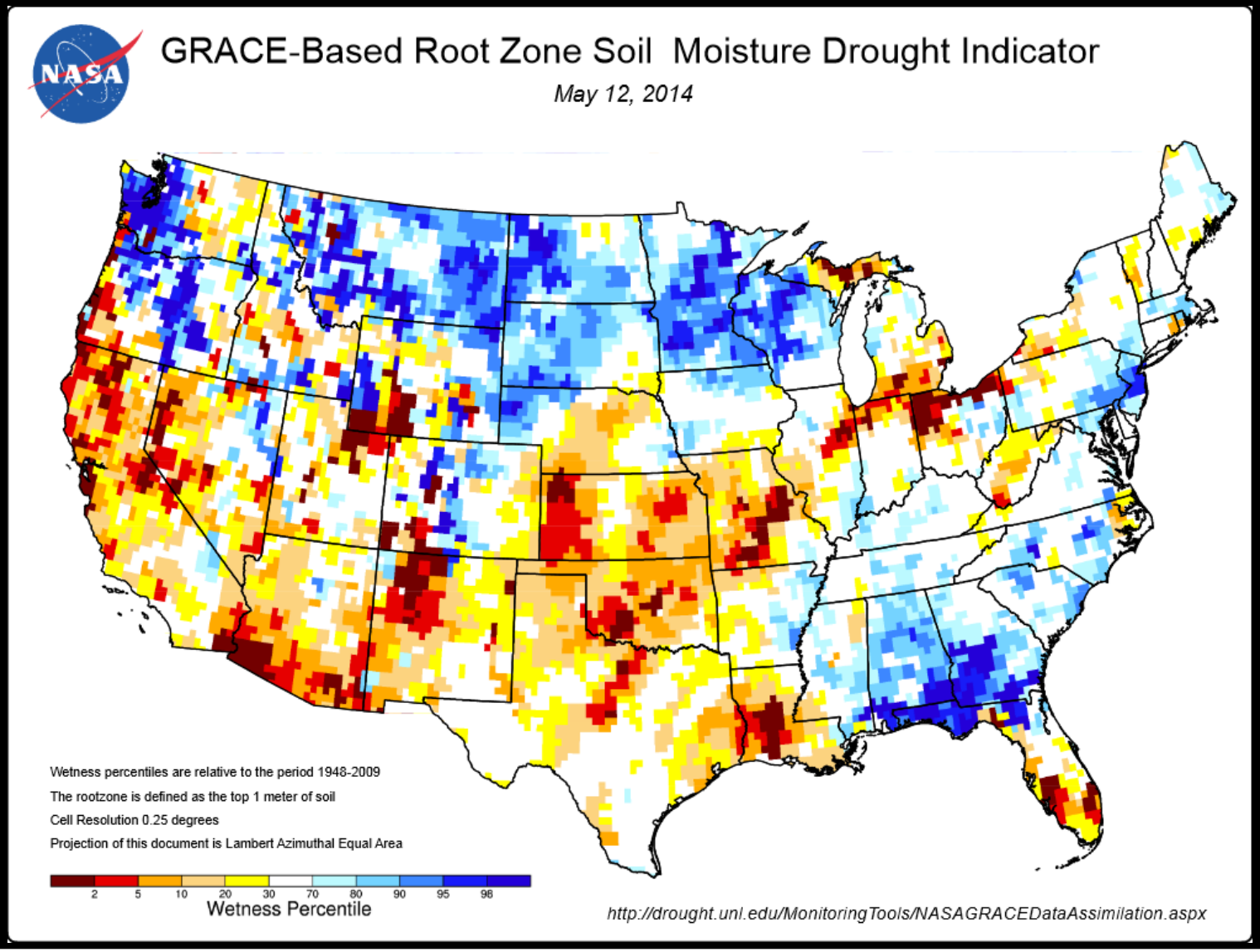
Inches of water equivalent

>	30
20 to	30
18 to	20
16 to	18
14 to	16
12 to	14
10 to	12
8 to	10
6 to	8
4 to	6
2 to	4
1 to	2
trace to	1

Not Estimated

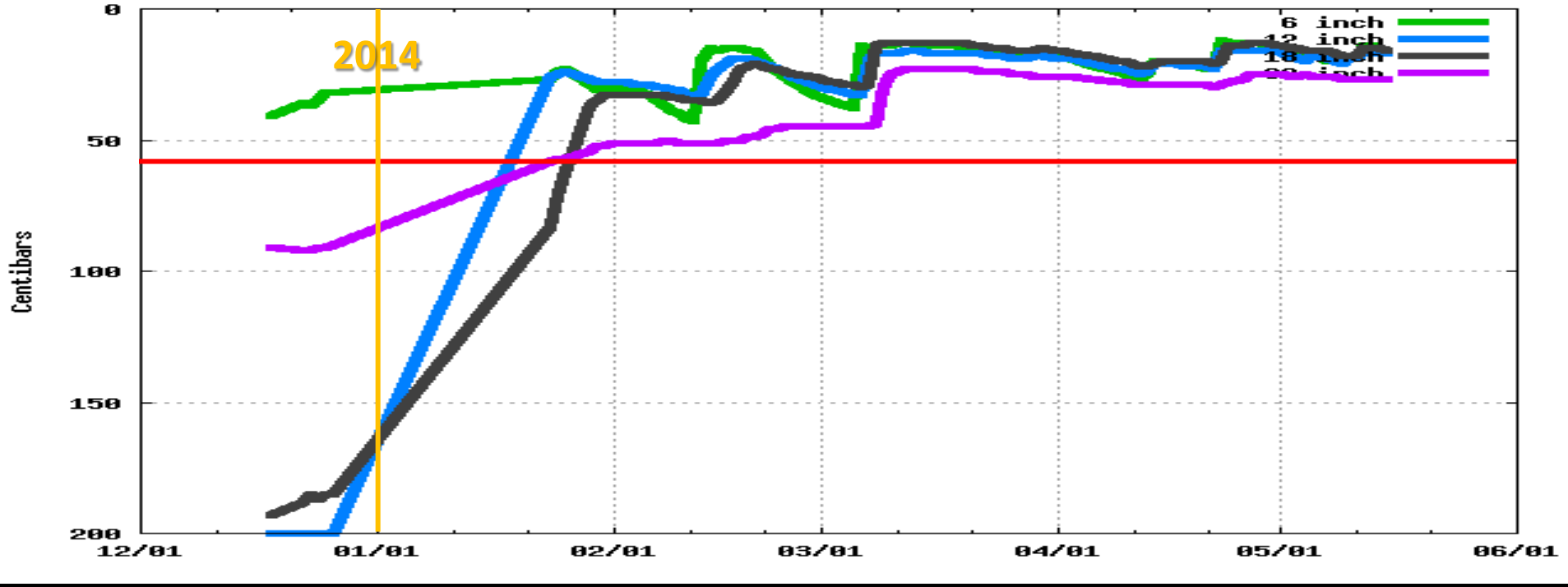
NOAA - National Weather Service

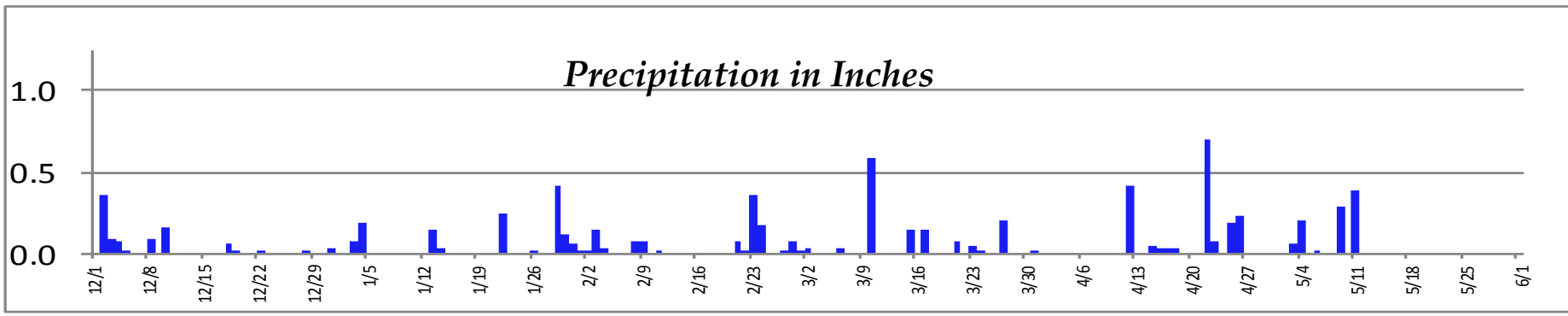
Soil Moisture – Upper 1 Meter



NOAA - National Weather Service

Great Falls Soil Moisture

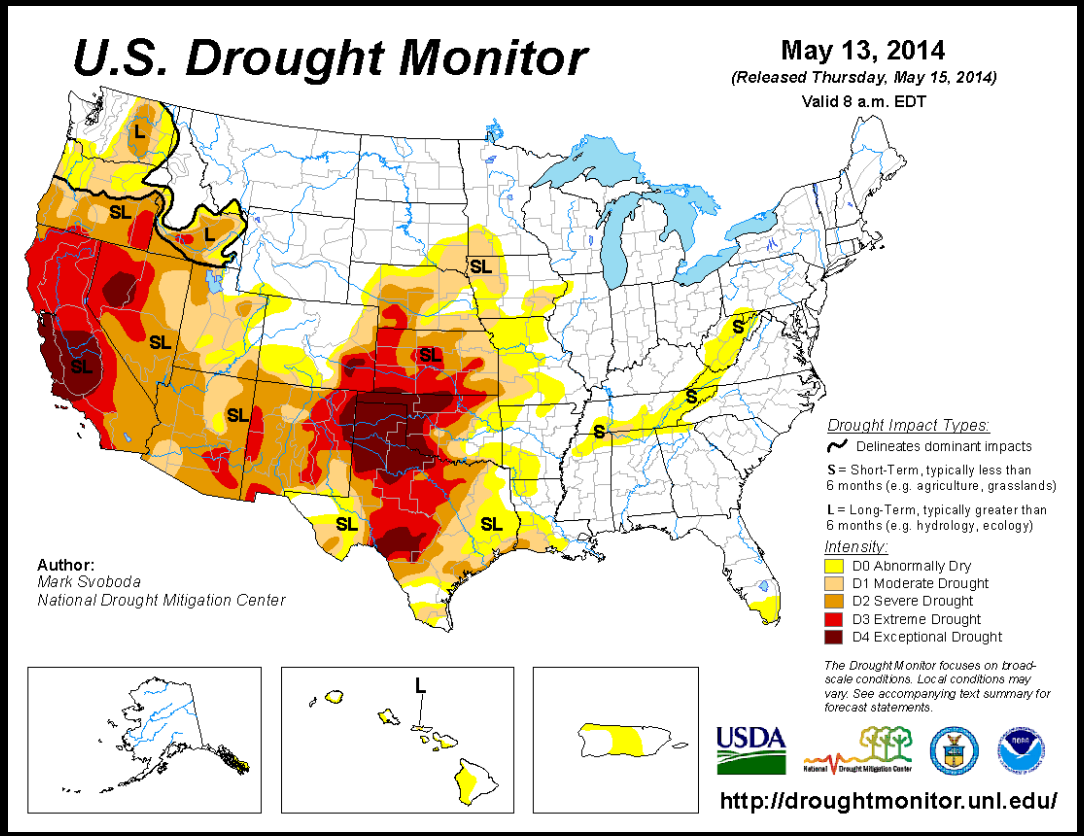


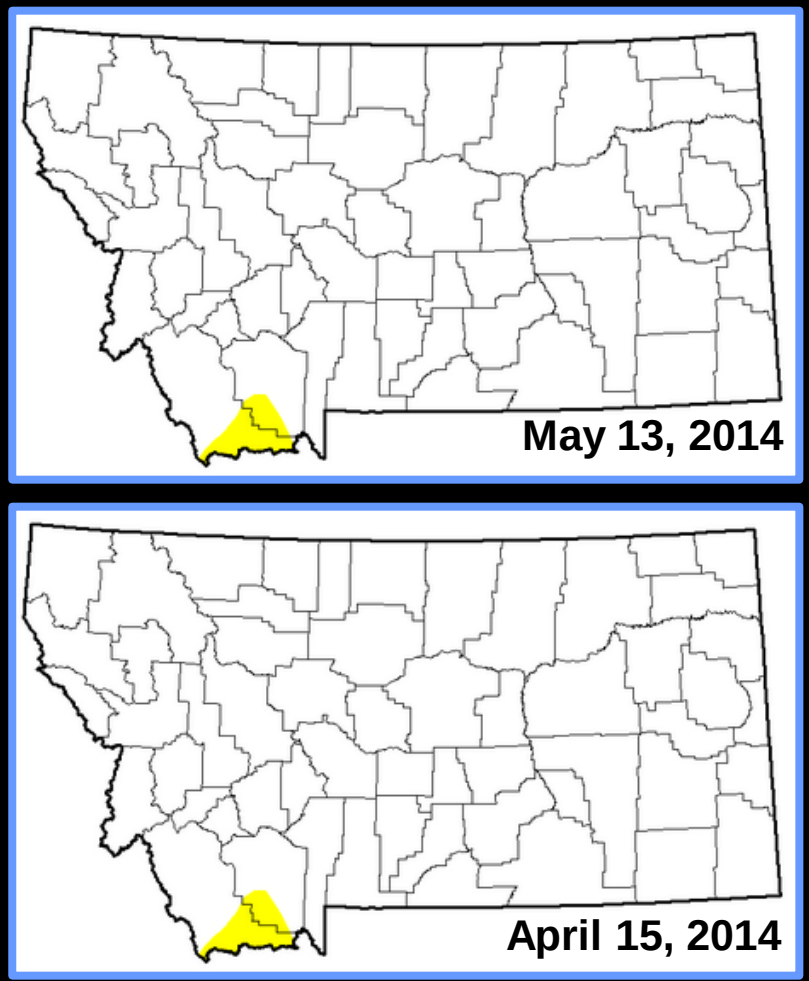


NOAA - National Weather Service

National Drought Monitor

Issued May 15

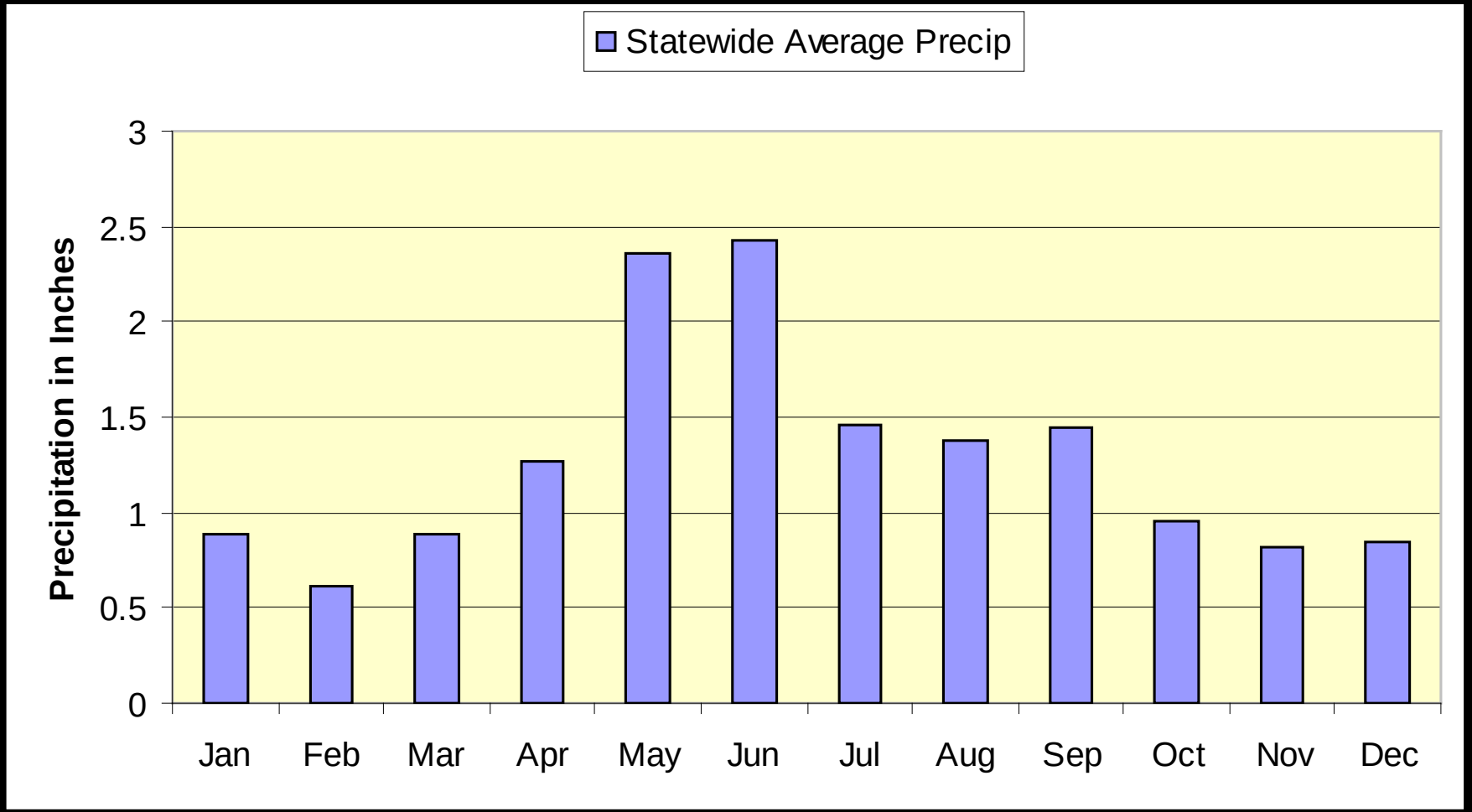




- 'Abnormally Dry' far southwest Montana

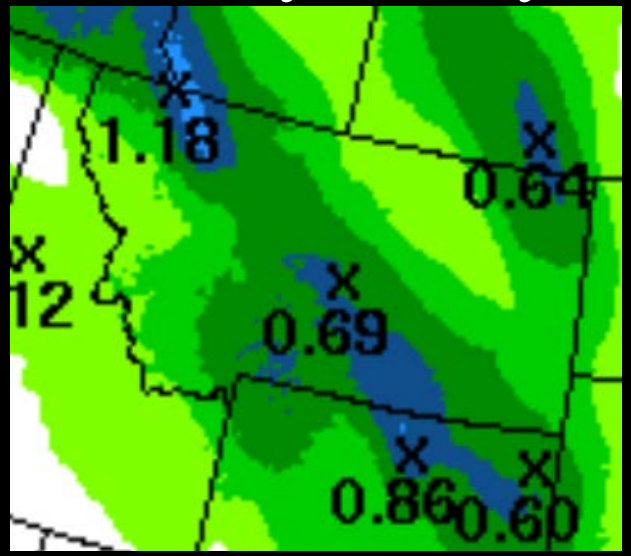
Statewide Average Precipitation

May and June highest precipitation months

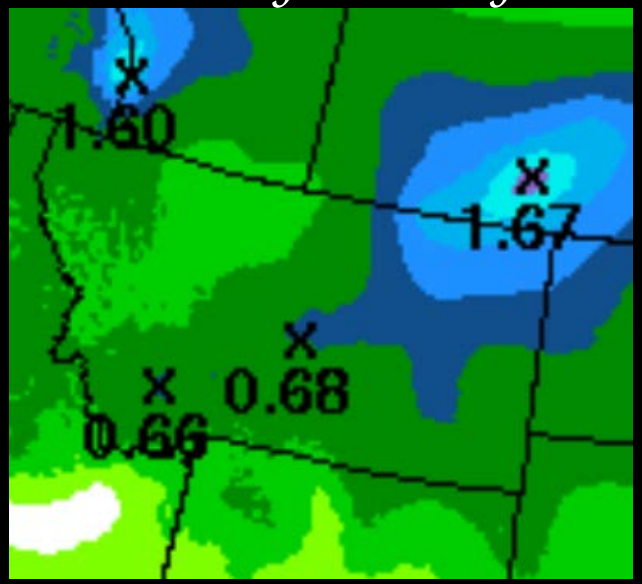


7-Day Precipitation Forecast

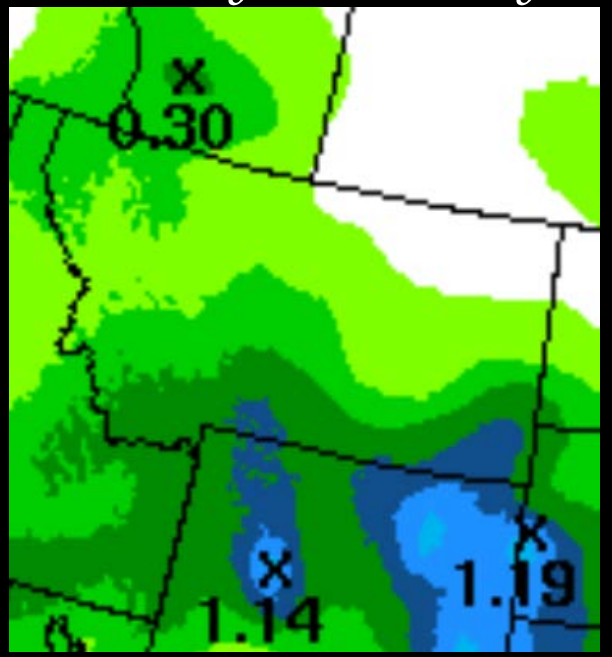
Thursday-Saturday



Sunday-Monday



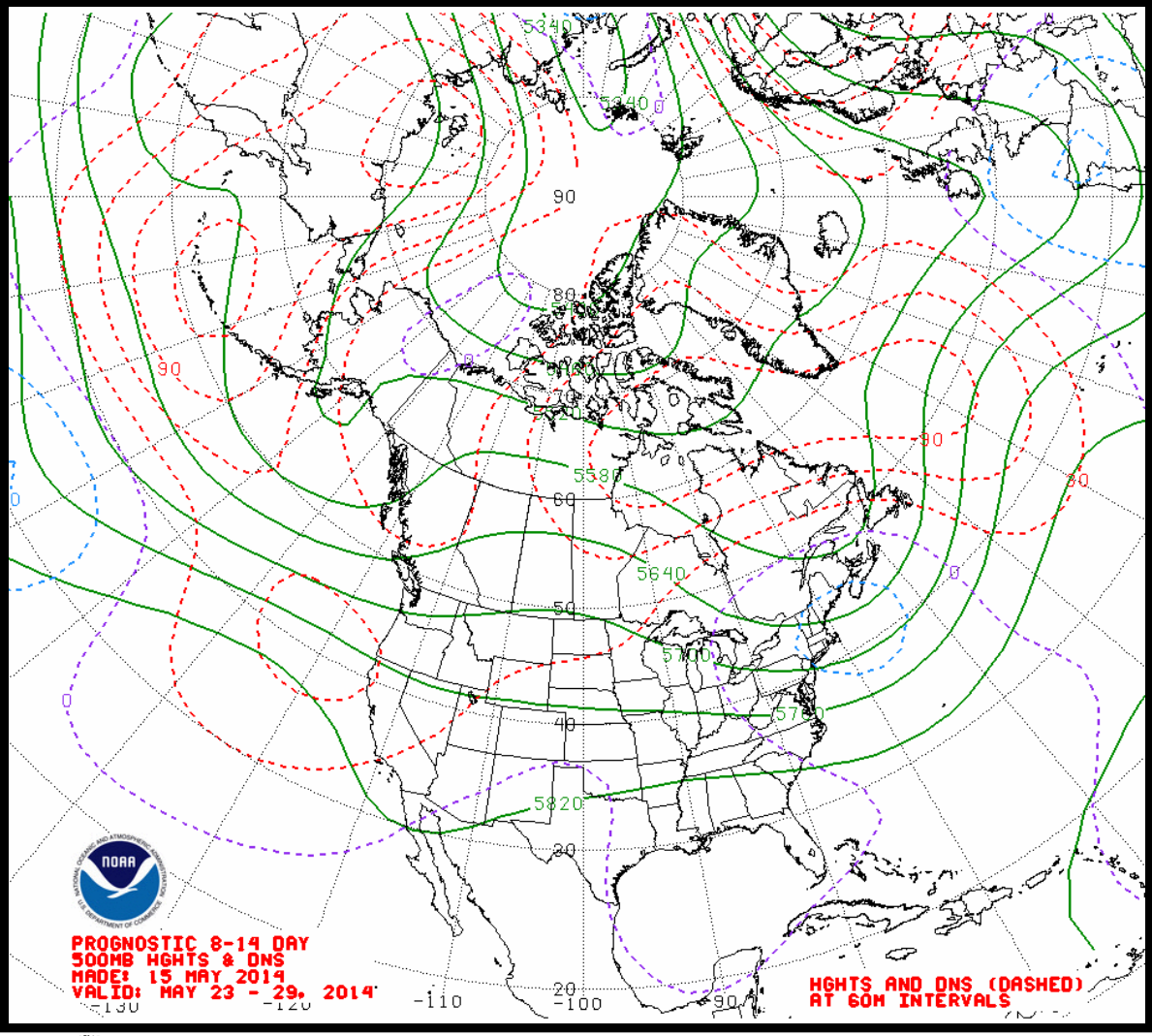
Tuesday-Wednesday



NOAA - National Weather Service

8 to 14 Day Outlook

500mb Heights and Anomalies



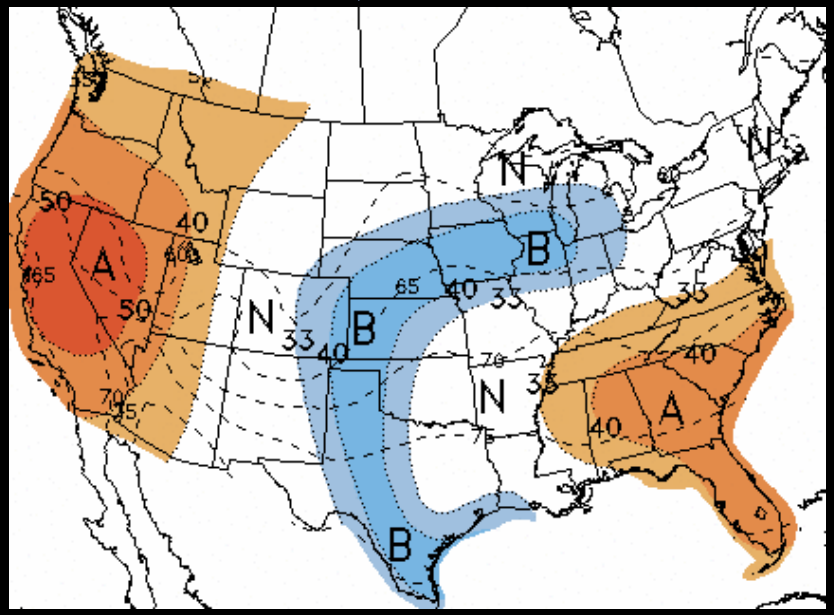
- May 22-28
- Westerly, split flow into Pacific Northwest with low pressure trough over eastern Pacific

NOAA - National Weather Service

8 to 14 Day Outlook

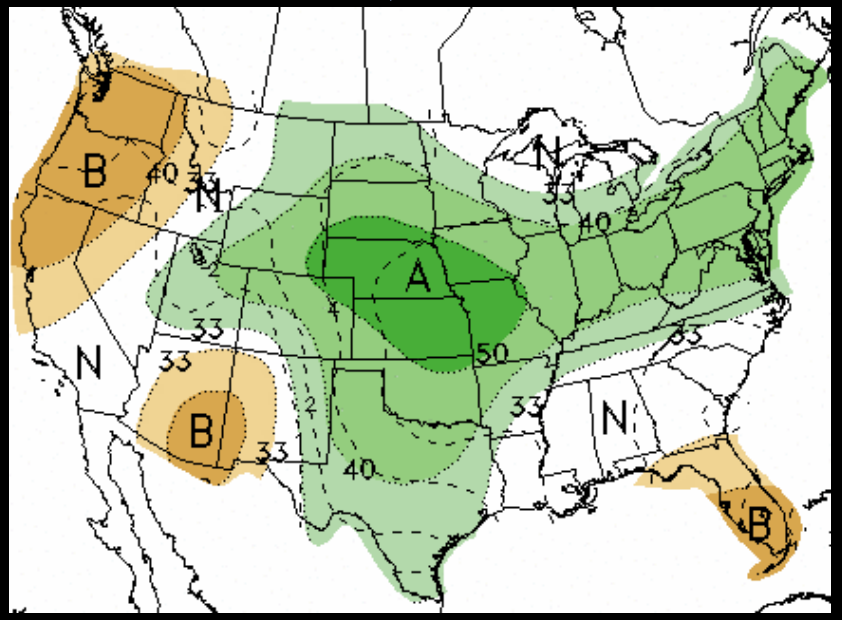
May 22 - 28

Temperature



- 33% to 50% chance temperatures will be above normal western half of Montana
- 33% to 50% chance temperatures will be below normal eastern Montana

Precipitation

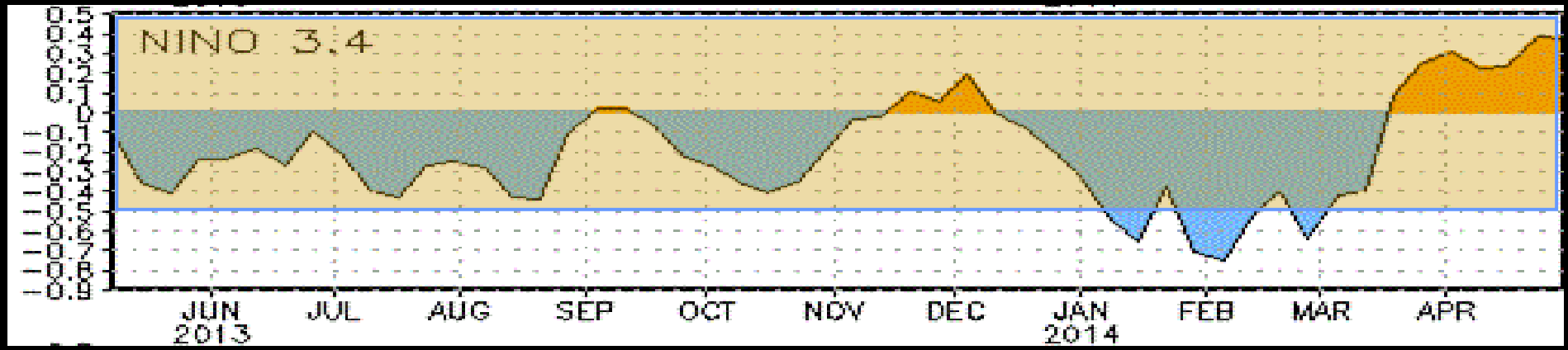


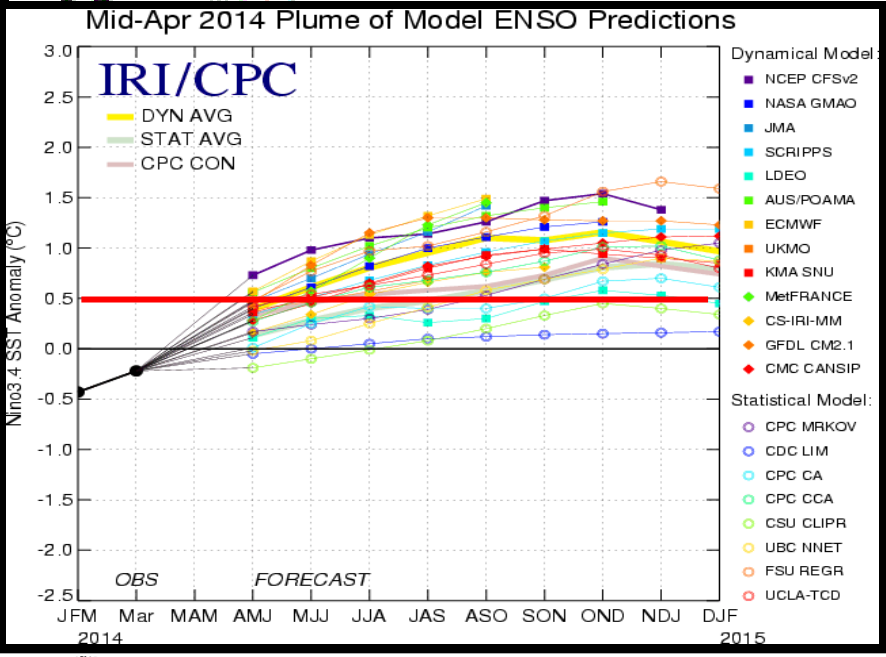
- 33% to 40% chance precipitation will be below normal northwest Montana
- 33% to 40% chance precipitation will be above normal southwest Montana

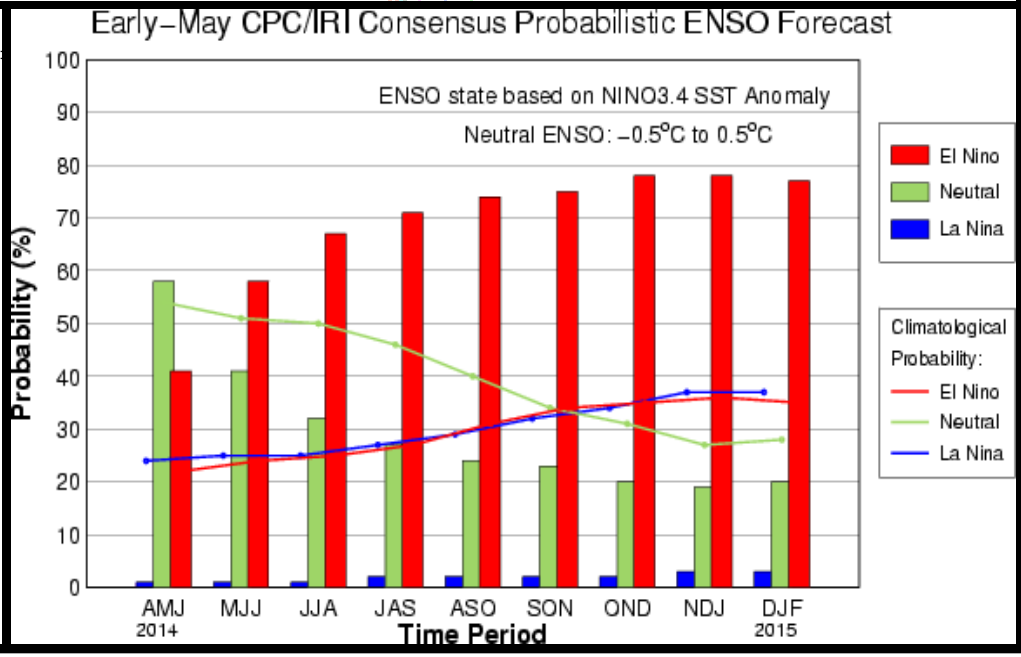
NOAA - National Weather Service

El Niño / La Niña

El Niño Watch - Chances of El Niño increase during the remainder of the year







NOAA - National Weather Service

For Montana, compared to normal years, El Nino years tend to have approximately…

- 20 percent more days with extreme high daytime temperatures
- 20 percent fewer days with extreme low nighttime temperatures
- 20 percent fewer days with high precipitation amounts

- "An increase or decrease of extreme daily weather occurrences can impact natural resources and a wide range of human activities including agriculture, forestry, recreation, construction and other businesses,"

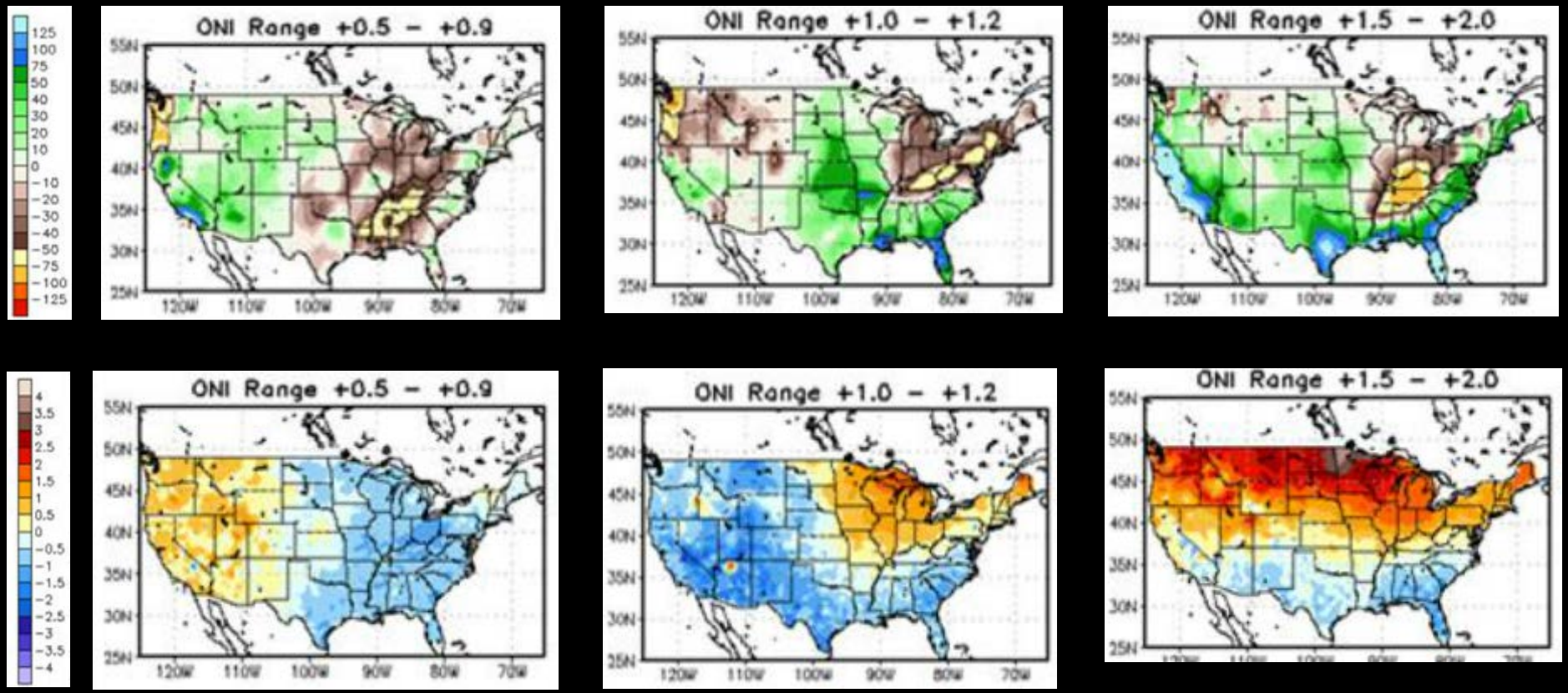
Joseph Caprio, professor emeritus in MSU's Department of Land Resources and Environmental Sciences and former Montana State Climatologist.

Jan-Feb-Mar El Nino Precipitation and Temperature Departure During El Niño

Weak
4 Cases

Moderate
4 Cases

Strong
4 Cases

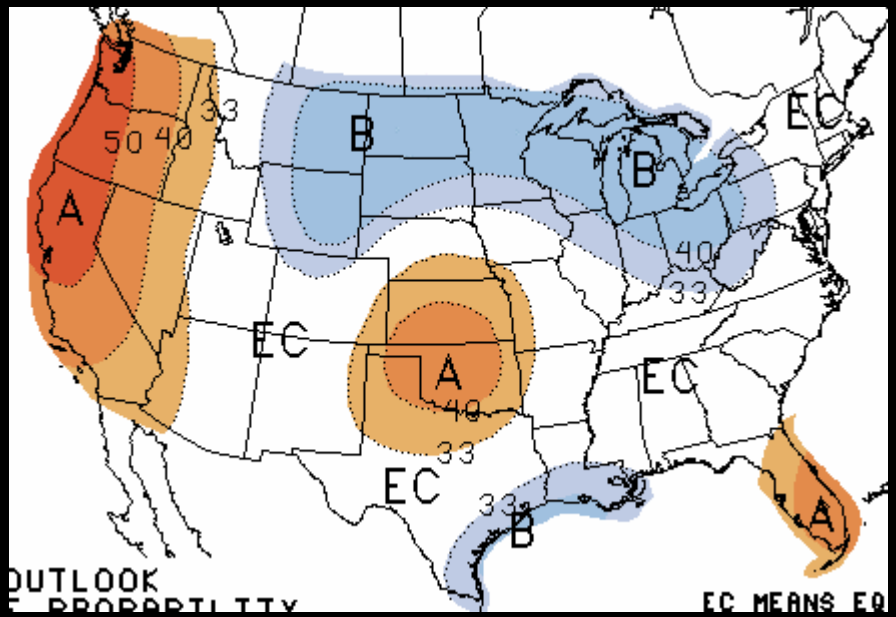


NOAA - National Weather Service

June Outlook

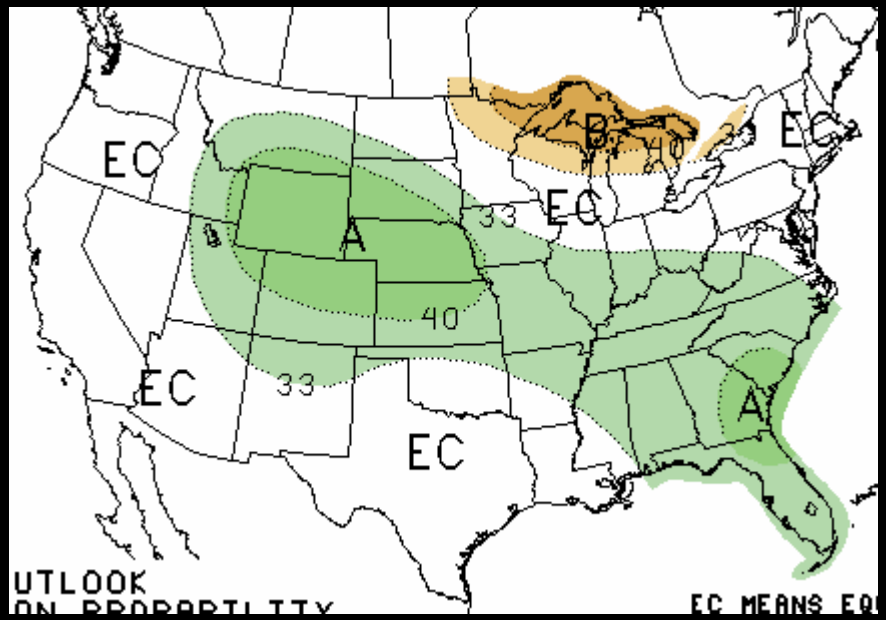
Updated May 15

Temperature



- 33% to 50% chance temperatures will be below normal over central and eastern Montana

Precipitation

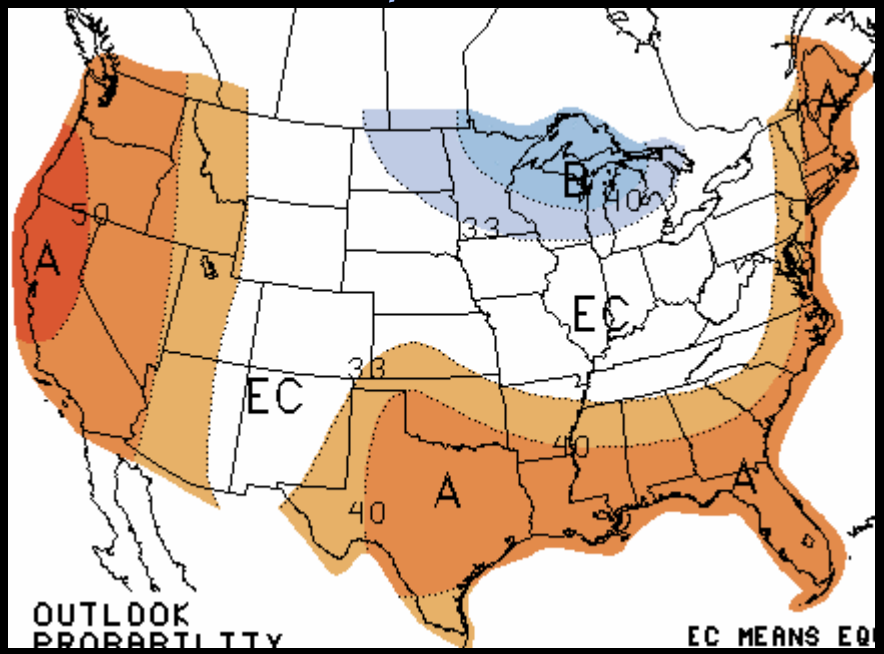


- 33% to 50% chance precipitation will be above normal over southern half of Montana

July – September Outlook

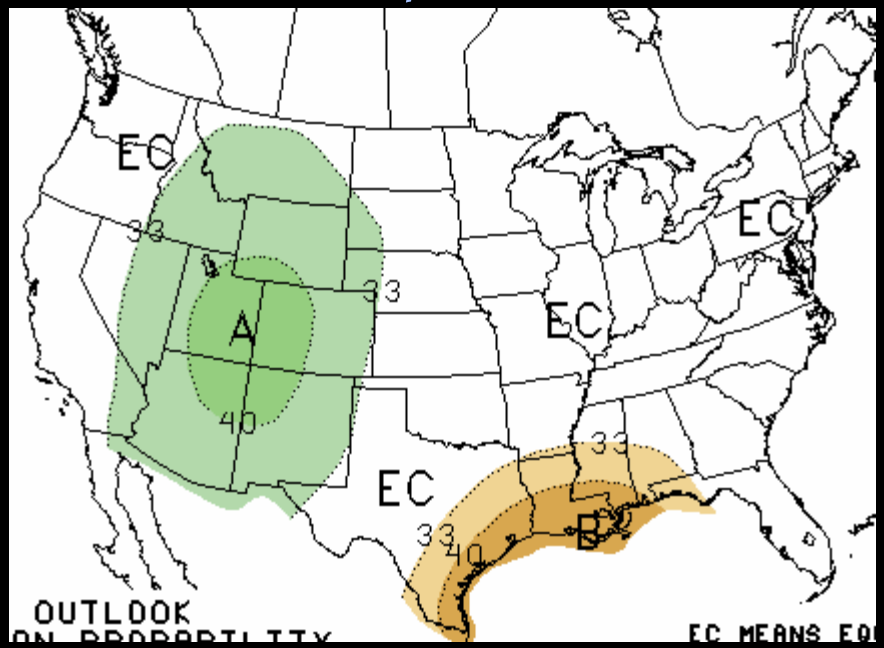
Updated May 15

Temperature



- 33% to 40% chance temperatures will be above normal over west and southwest Montana

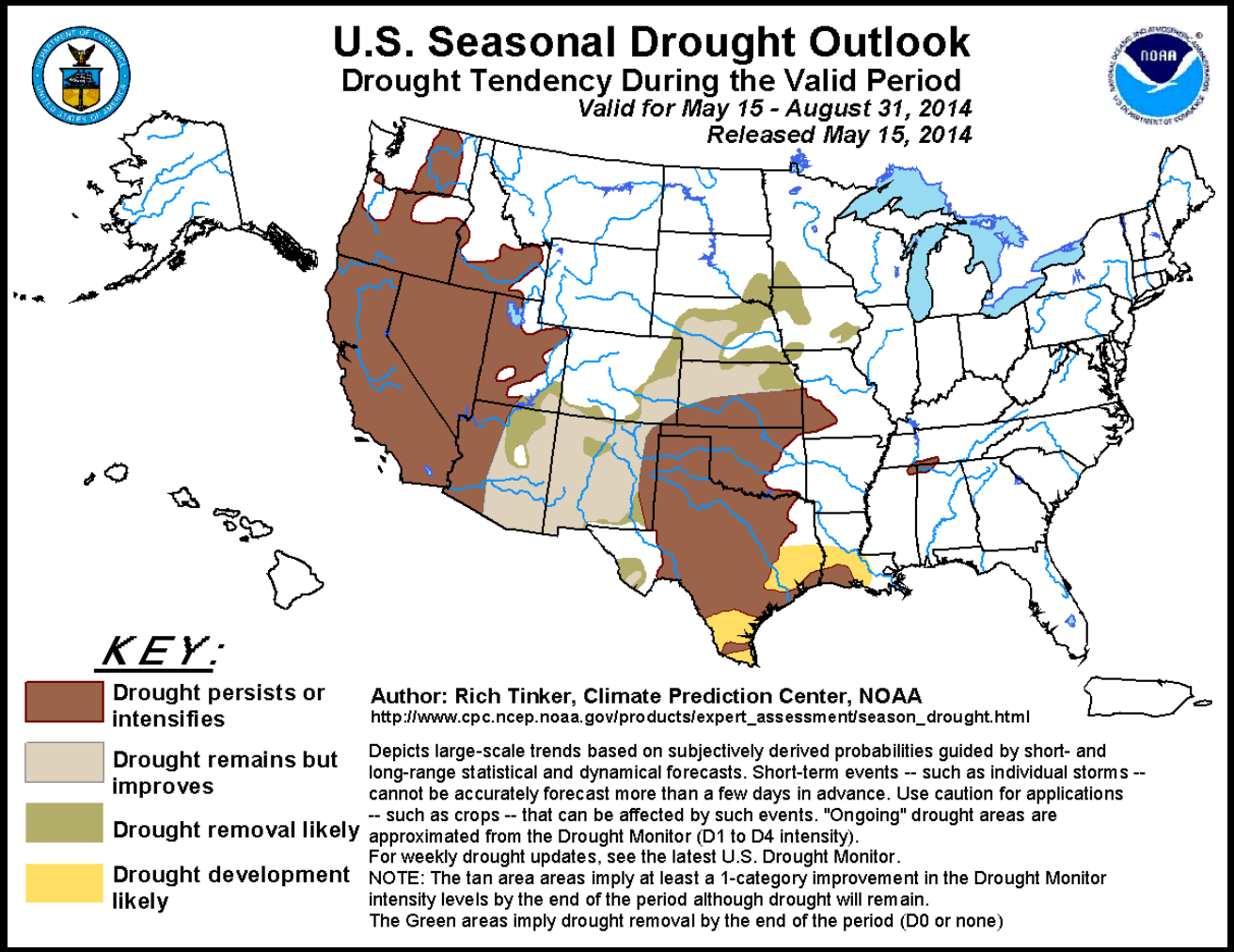
Precipitation



- 33% to 40% chance precipitation will be above normal over central and southern Montana

Drought Outlook through August

Issued May 15

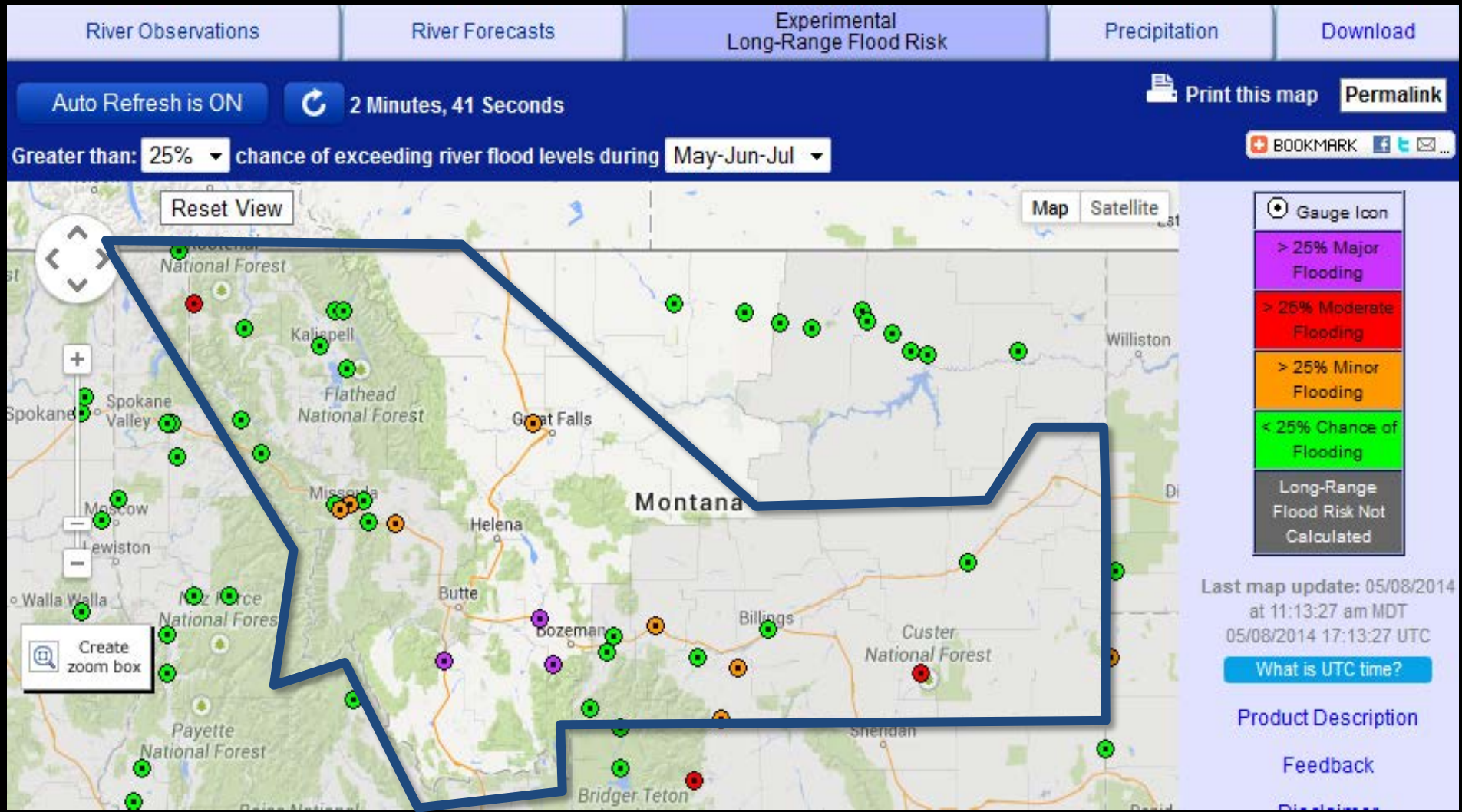


- Drought area just to southwest of Montana expected to persist/intensify

NOAA - National Weather Service

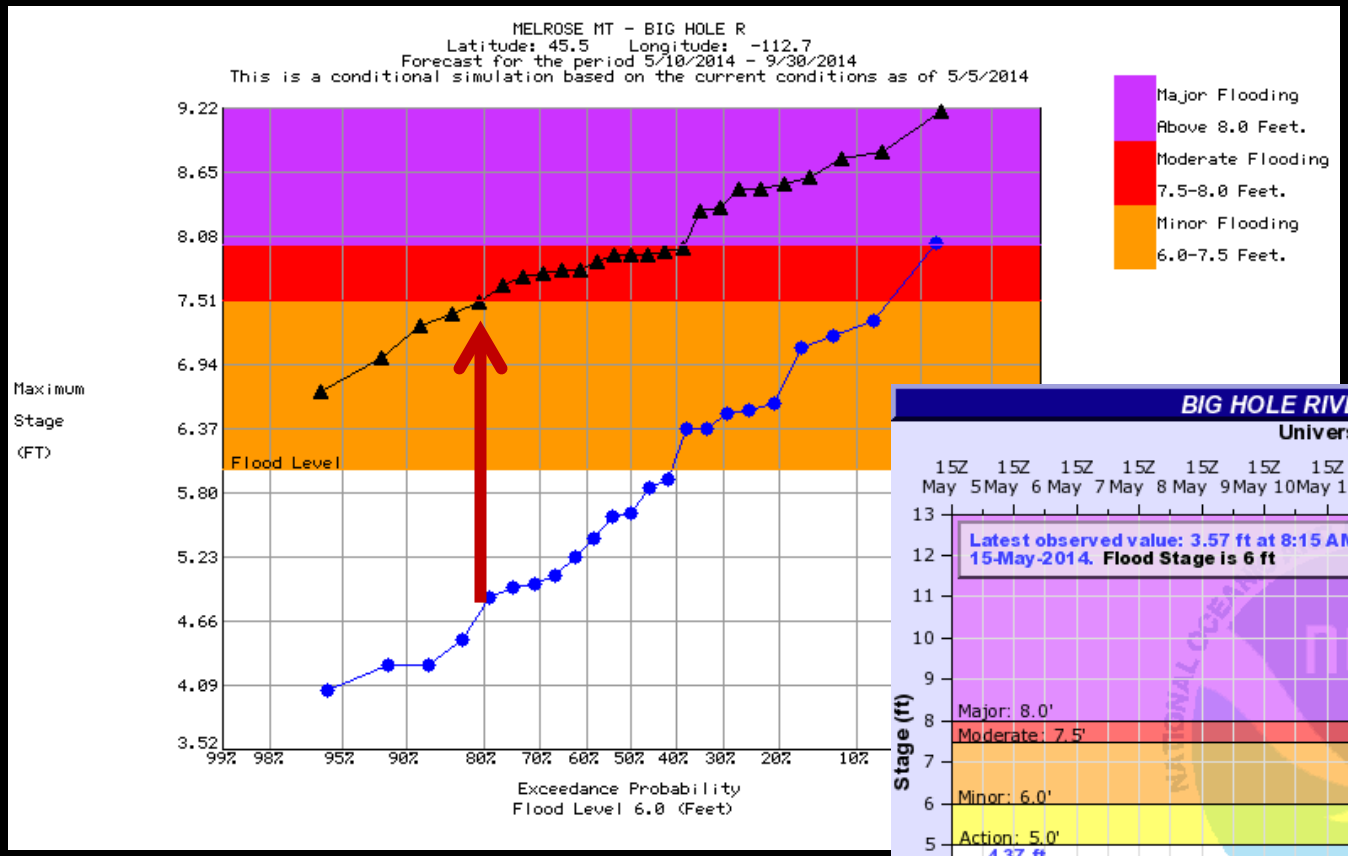
Chances of Flooding through June

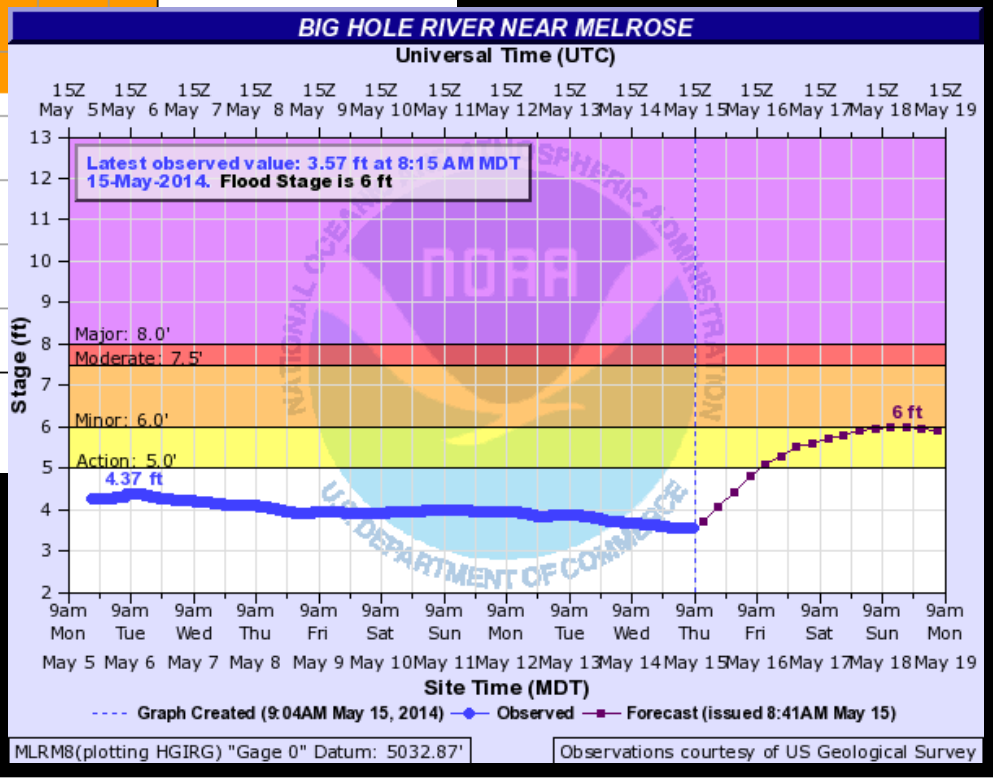
Based on conditions as of May 5



NOAA - National Weather Service

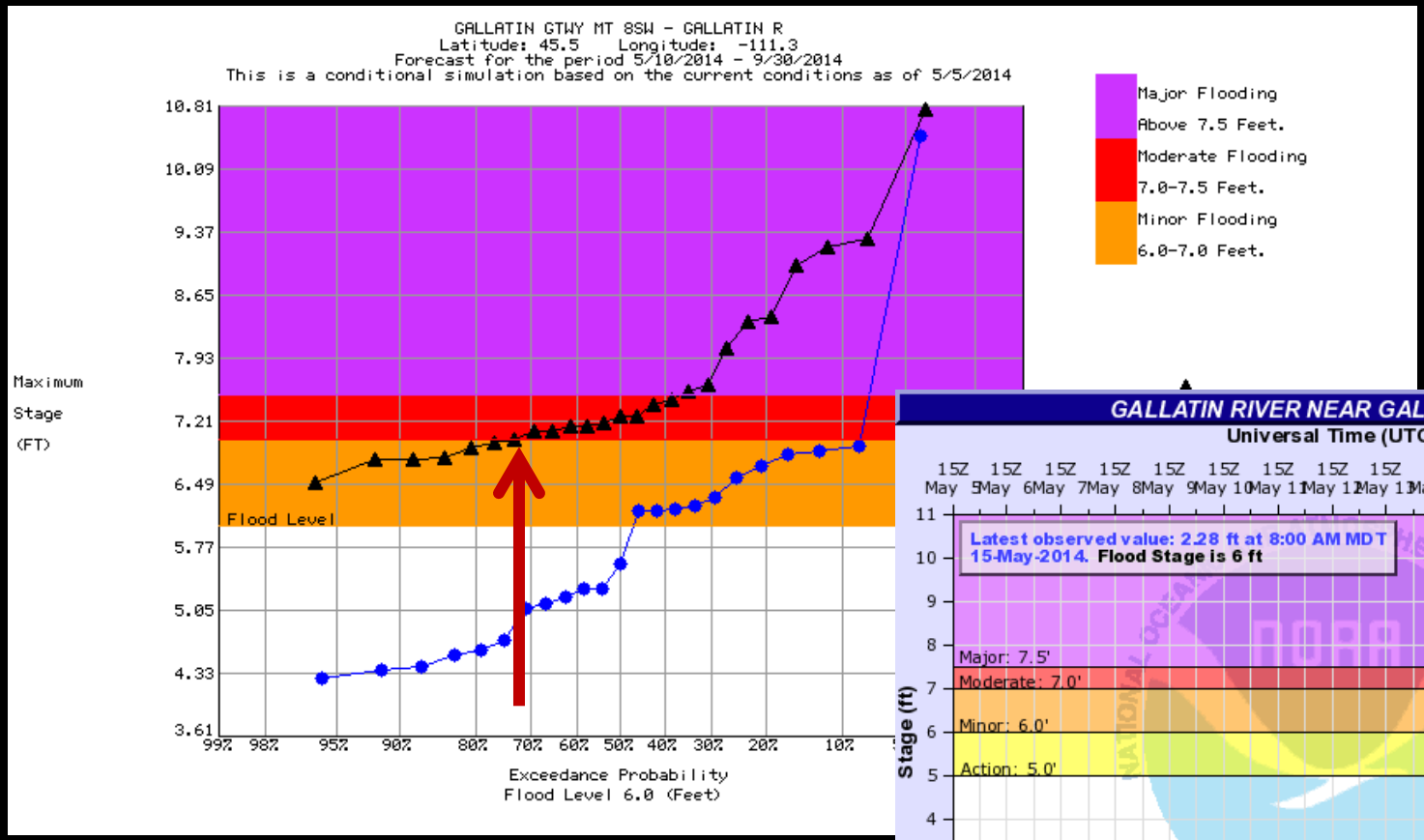
Big Hole River - Melrose

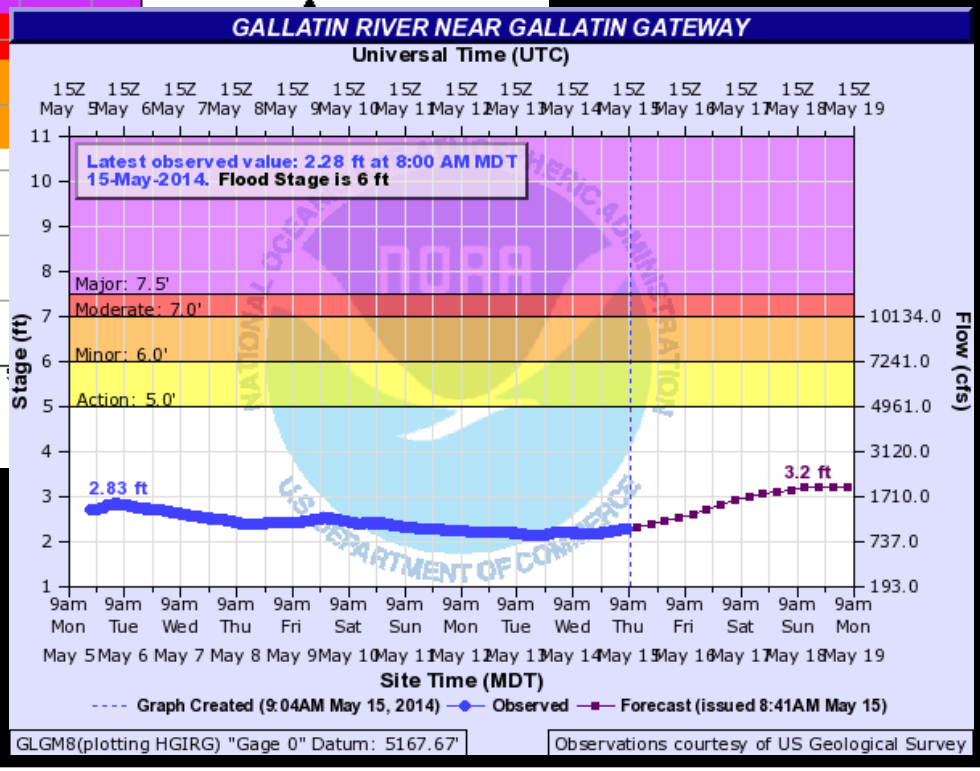




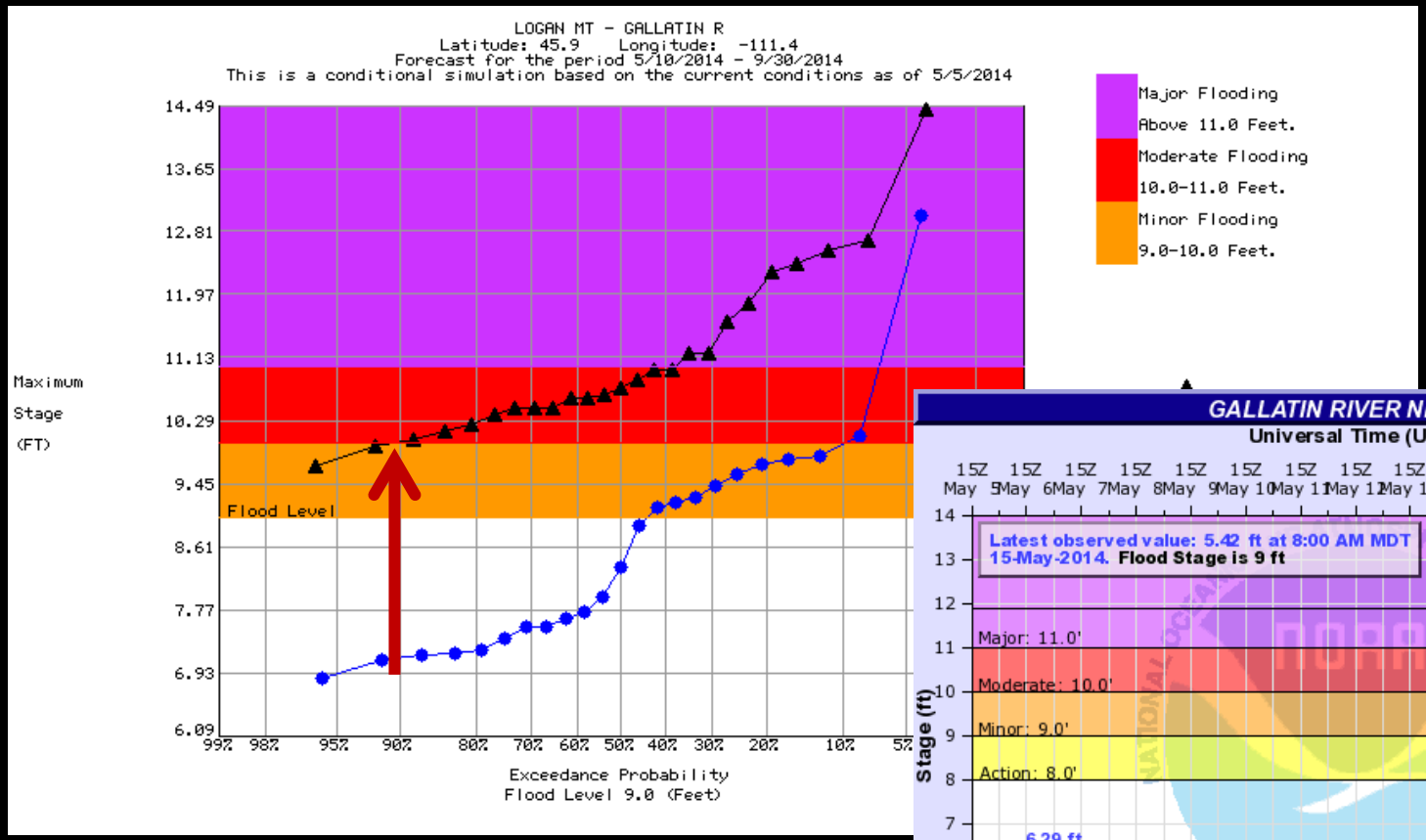
NOAA - National Weather Service

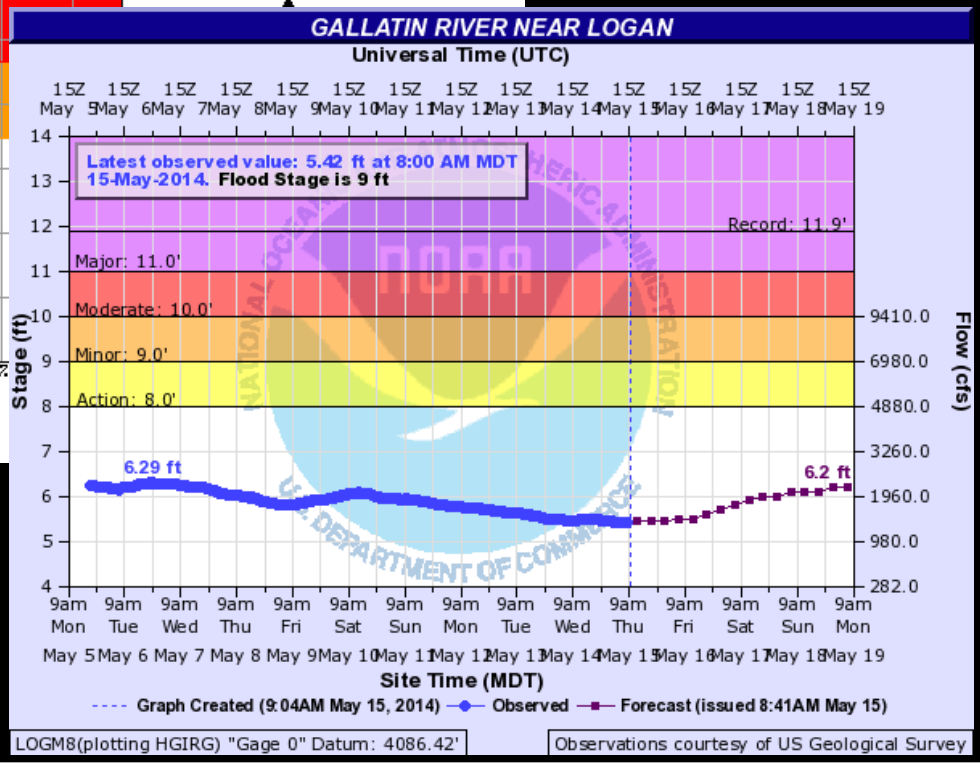
Gallatin River – Gallatin Gateway





Gallatin River - Logan





NOAA - National Weather Service

In Summary...

- Drier conditions in April allowed for some snowmelt in lower and mid elevations without flooding
- Still anticipate minor to moderate flooding west, southwest, and south
  - Particularly mountain-fed stream and small rivers
- Game changing event would rapidly increase chances of and severity of flooding
  - May and June peak months for flooding
- No drought conditions noted on National Drought Monitor or Montana Drought Status Map
  - Small area of abnormally dry in far southwest

weather.gov

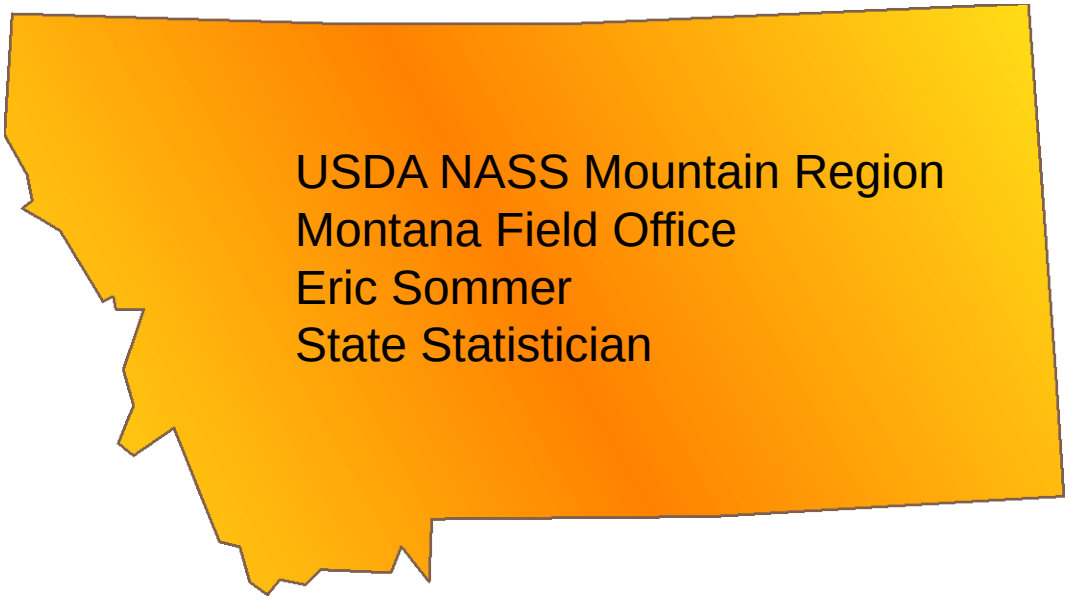
weather.gov/billings

weather.gov/glasgow

weather.gov/missoula

weather.gov/greatfalls

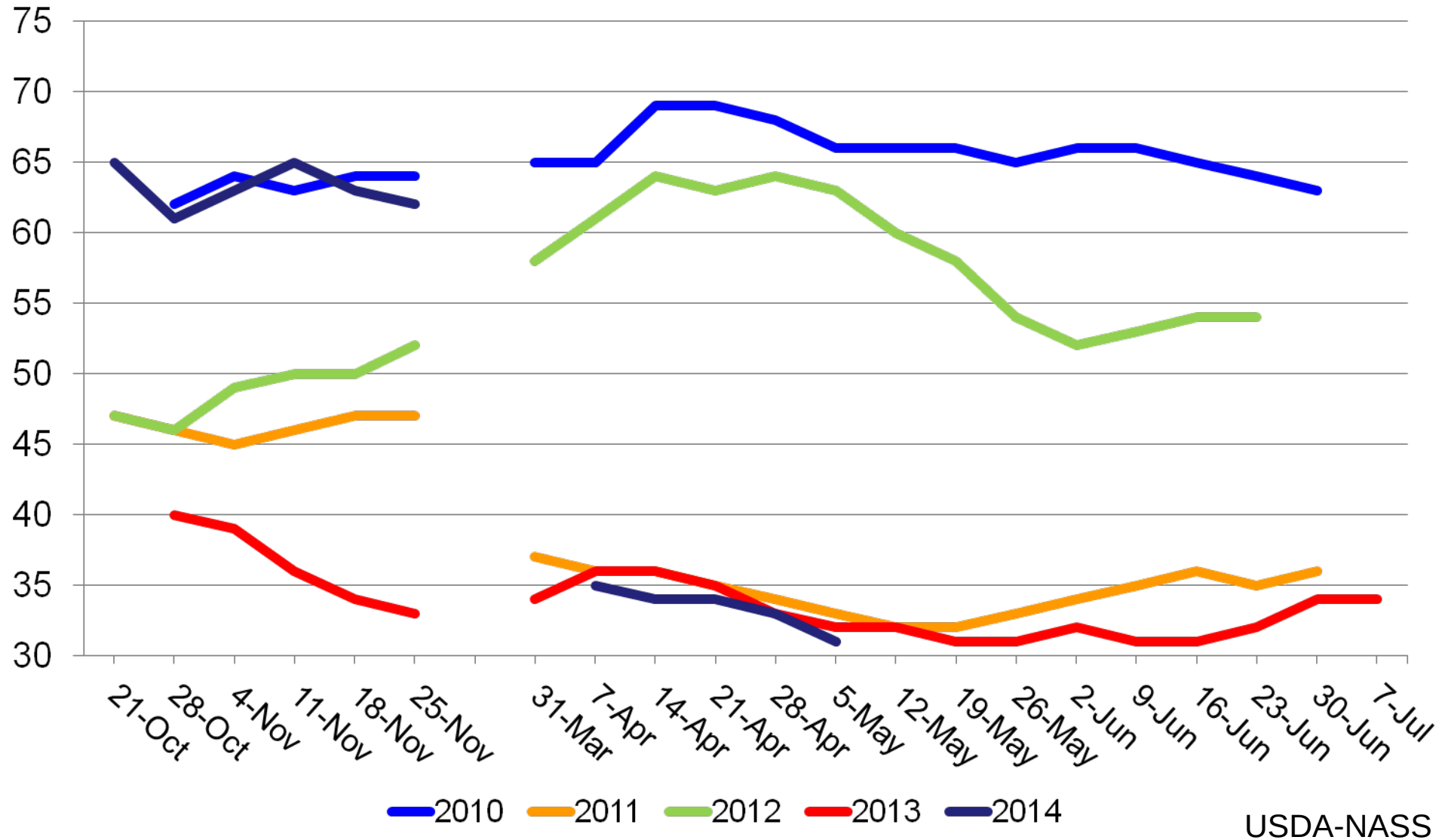
Governor's Drought & Water Supply Advisory Committee



USDA NASS Mountain Region
Montana Field Office
Eric Sommer
State Statistician

US Winter Wheat Condition

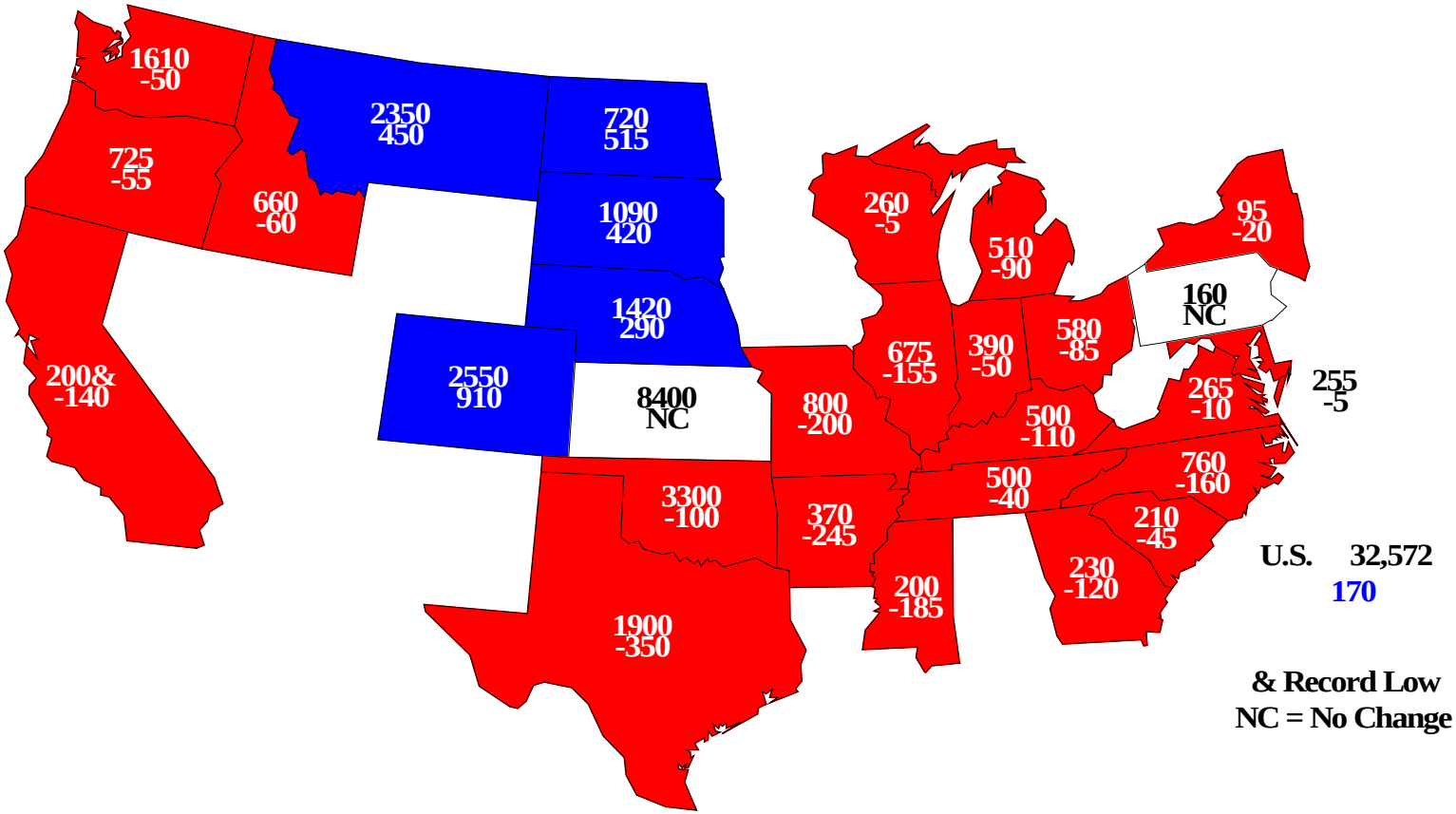
Percent Rated Good to Excellent



USDA-NASS
05-09-14

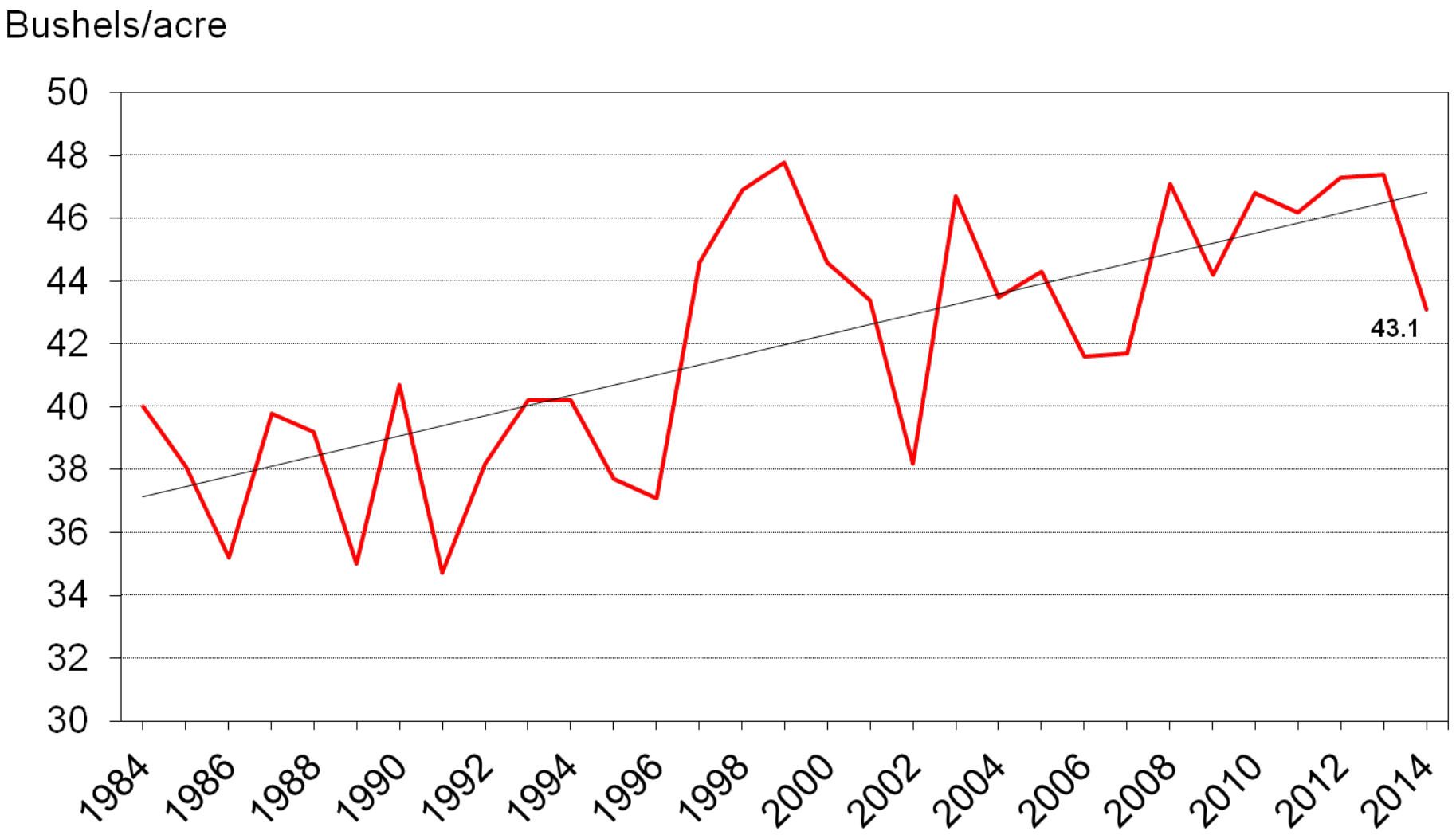
Winter Wheat Harvested, 2014

Acres (000) and Change From Previous Year



USDA-NASS
05-09-14

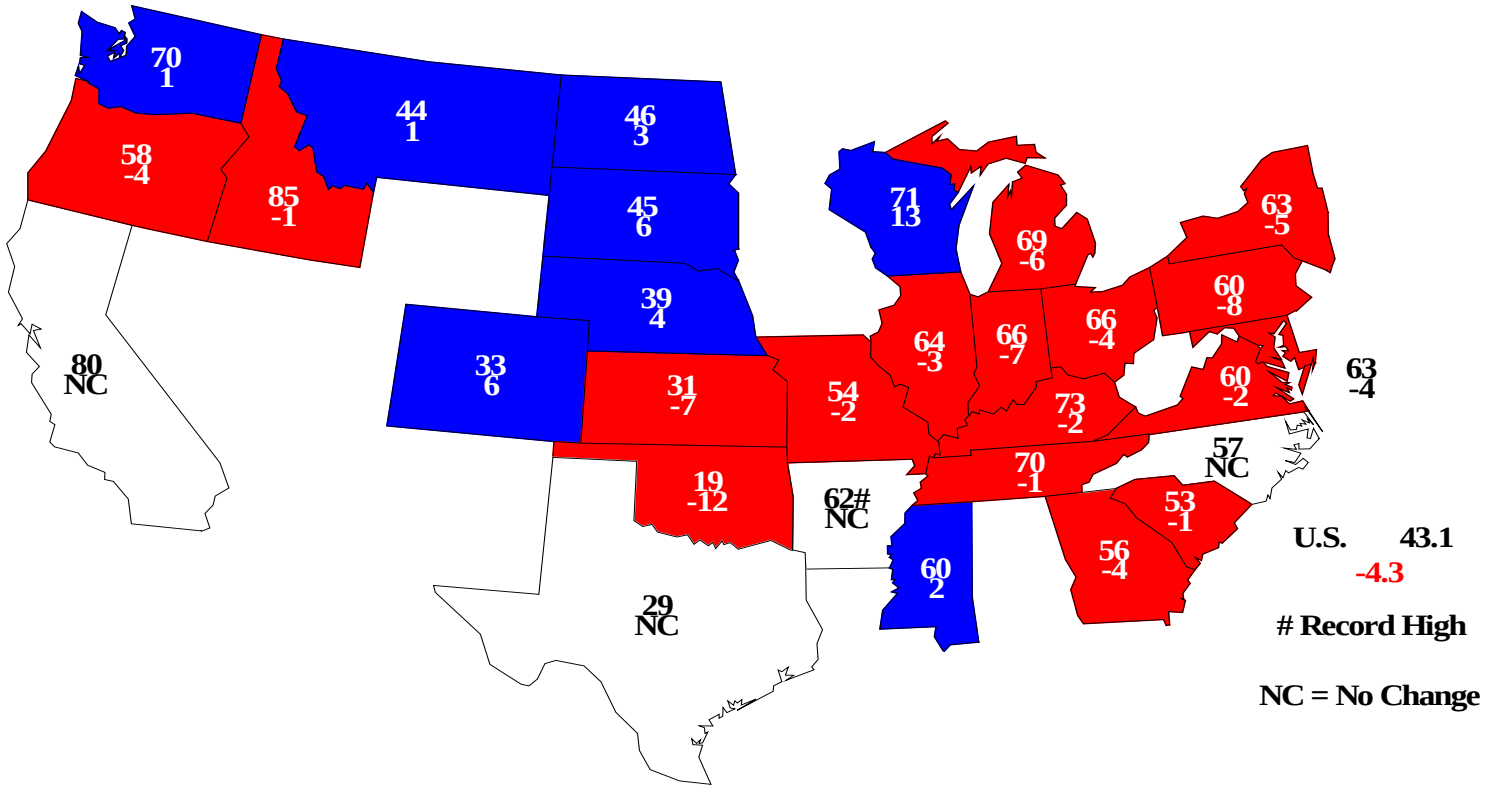
U.S. Winter Wheat Yield



USDA-NASS
05-09-14

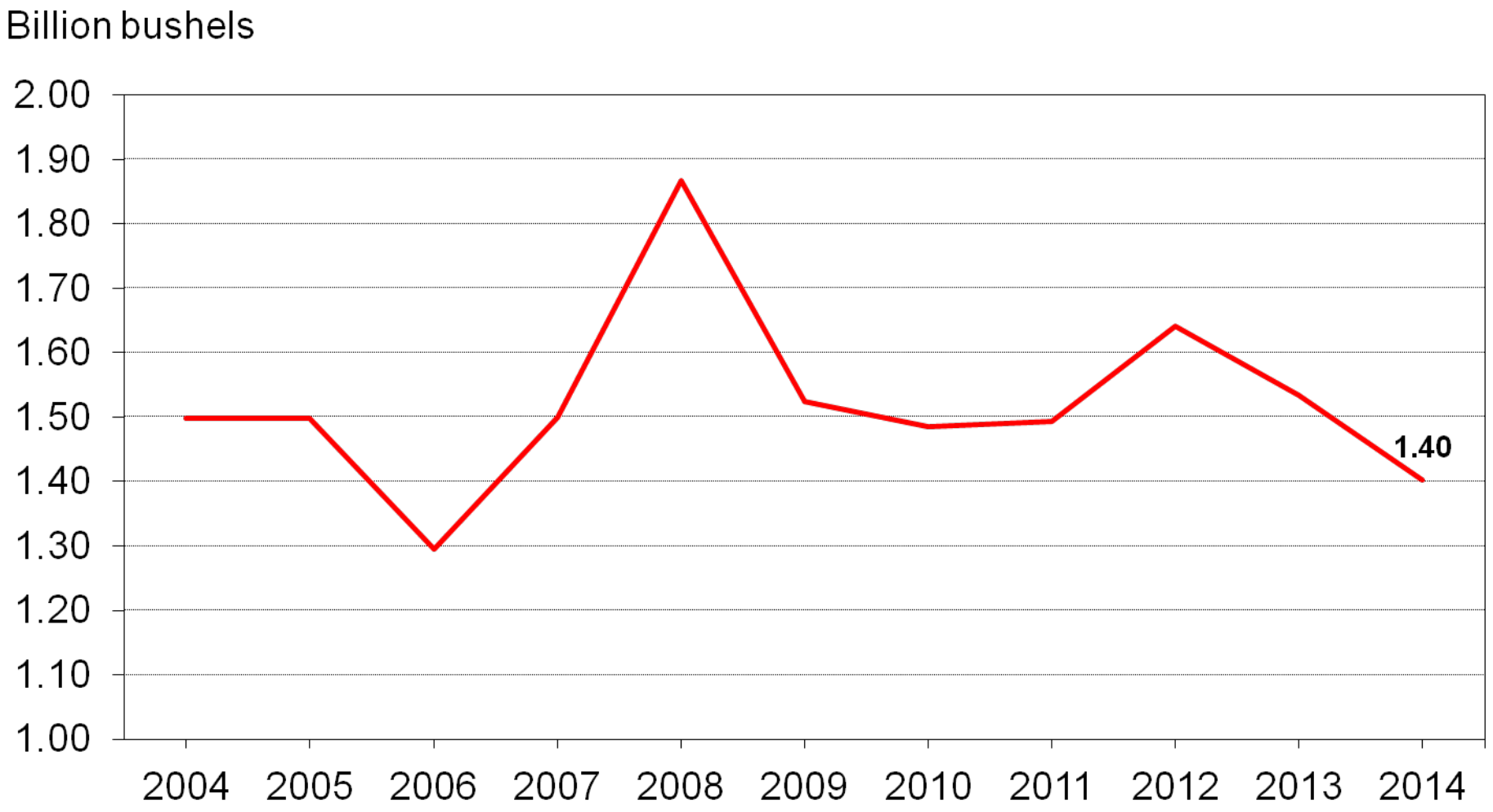
Winter Wheat Yield - May 1, 2014

Bushels and Change From Previous Year



USDA-NASS
05-09-14

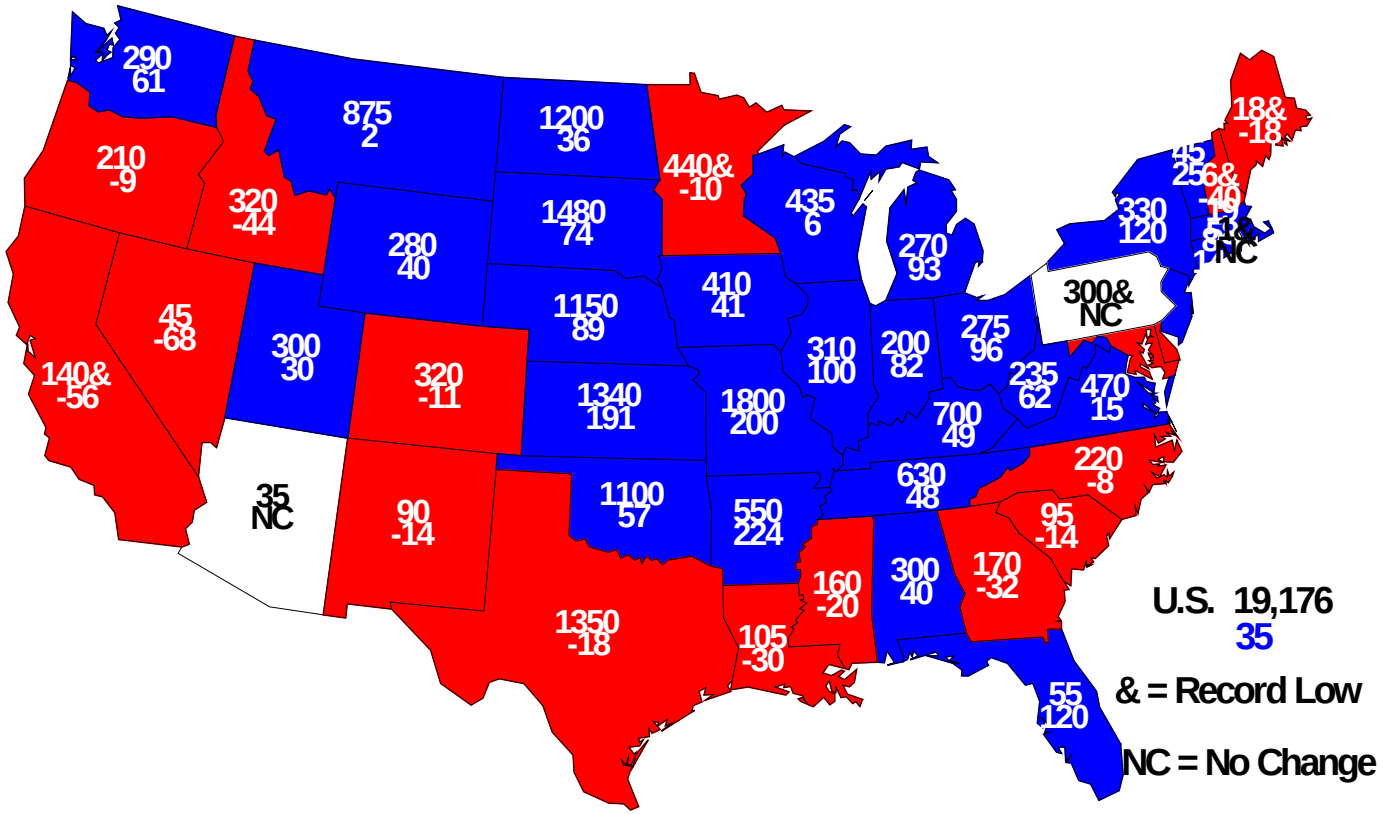
U.S. Winter Wheat Production



USDA-NASS
05-09-14

All Hay Stocks - May 1, 2014

Stocks (000) and Percent Change From Previous Year



USDA-NASS
05-09-14

Crop Weather Report
Week Ending May 11, 2014

- Topsoil and subsoil moisture conditions were better than a year ago but comparable to the five year average.

- Producers have made a lot of progress seeding their spring crops. Late winter/Early spring storms still have producers playing catch up.

Topsoil Moisture

Week Ending May 11, 2014

	This week	Last week	Last year	5-yr avg.
Very short	4	4	17	4
Short	9	9	30	13
Adequate	75	77	51	67
Surplus	12	10	2	16

Subsoil Moisture

Week Ending May 11, 2014

	This week	Last week	Last year	5-yr avg.
Very short	2	2	19	6
Short	12	11	30	17
Adequate	80	82	49	69
Surplus	6	5	2	8

Winter Wheat Condition
Week Ending May 11, 2014

	Very poor	Poor	Fair	Good	Excellent
This week	2	5	31	45	17
Last week	1	5	31	46	17
Last year	5	10	33	44	8
5-yr avg.	2	7	29	50	12

Seeding Completed
Week Ending May 11, 2014

	This week	Last week	Last year	5-yr avg.
Spring Wheat	51	37	54	56
Barley	73	54	77	64
Oats	24	14	53	48
Dry Peas	66	47	54	62
Lentils	41	21	42	59
Flaxseed	13	1	7	31
Canola	46	34	57	48

Seeding Completed
Week Ending May 11, 2014

	This week	Last week	Last year	5-yr avg.
Corn	34	16	41	43
Potatoes	3	na	54	30
Sugar Beets	91	65	29	67
Durum Wheat	23	9	23	36

Emerged
Week Ending May 11, 2014

	This week	Last week	Last year	5-yr avg.
Spring Wheat	8	1	4	15
Barley	27	2	21	25
Oats	7	na	9	17
Dry Peas	16	1	5	9
Canola	15	1	7	7
Sugar Beets	17	0	4	25

Livestock Grazing
Week Ending May 11, 2014

- 43 percent of Cattle and Calves have been moved to summer ranges, ahead of last years 38 percent and the five-year average of 32 percent.
- 38 percent of Sheep and Lambs have been moved to summer ranges, behind last years 42 percent but ahead of the five-year average of 29 percent.
- 49 percent of cattle & calves and 44 percent of sheep & lambs were receiving supplemental feed

Range & Pasture Feed Condition

Week Ending May 11, 2014

	Very poor	Poor	Fair	Good	Excellent
This week	2	15	40	39	4
Last week	2	16	44	35	3
Last year	21	32	31	15	1
5-yr avg.	6	14	37	37	6

Calving & Lambing Completed
Week Ending May 11, 2014

- 89 percent of cows have calved, behind last year's 94 percent and the five-year average of 93 percent.
- 82 percent of ewes have lambed, compared to 87 percent last year and 83 percent for the five-year average.

Summary
Week ending May 11, 2014

- Soil moisture conditions continue to be above average thanks to ample snowpack and continued precipitation
- 4.0 days were suitable for field work during the week, compared to 6.4 days last year and 4.5 days for the five-year average
- Spring planting of most crops has almost caught up to the 5 year average

June Releases

- June Hog Report released on June 27
- June Acreage, and June StocksJune Hog Reports released on June 30

USDA, NASS, Montana Field Office

Eric Sommer, State Statistician

1-800-835-2612 or 406-441-1240

Email: nass-mt@nass.usda.gov

www.nass.usda.gov/mt/

http://www.nass.usda.gov/Statistics_by_State/Montana Publications/Crop_Progress_&_Condition/index.asp

Governor's Drought & Water Supply Advisory Committee

Snow Survey and Water Supply Report

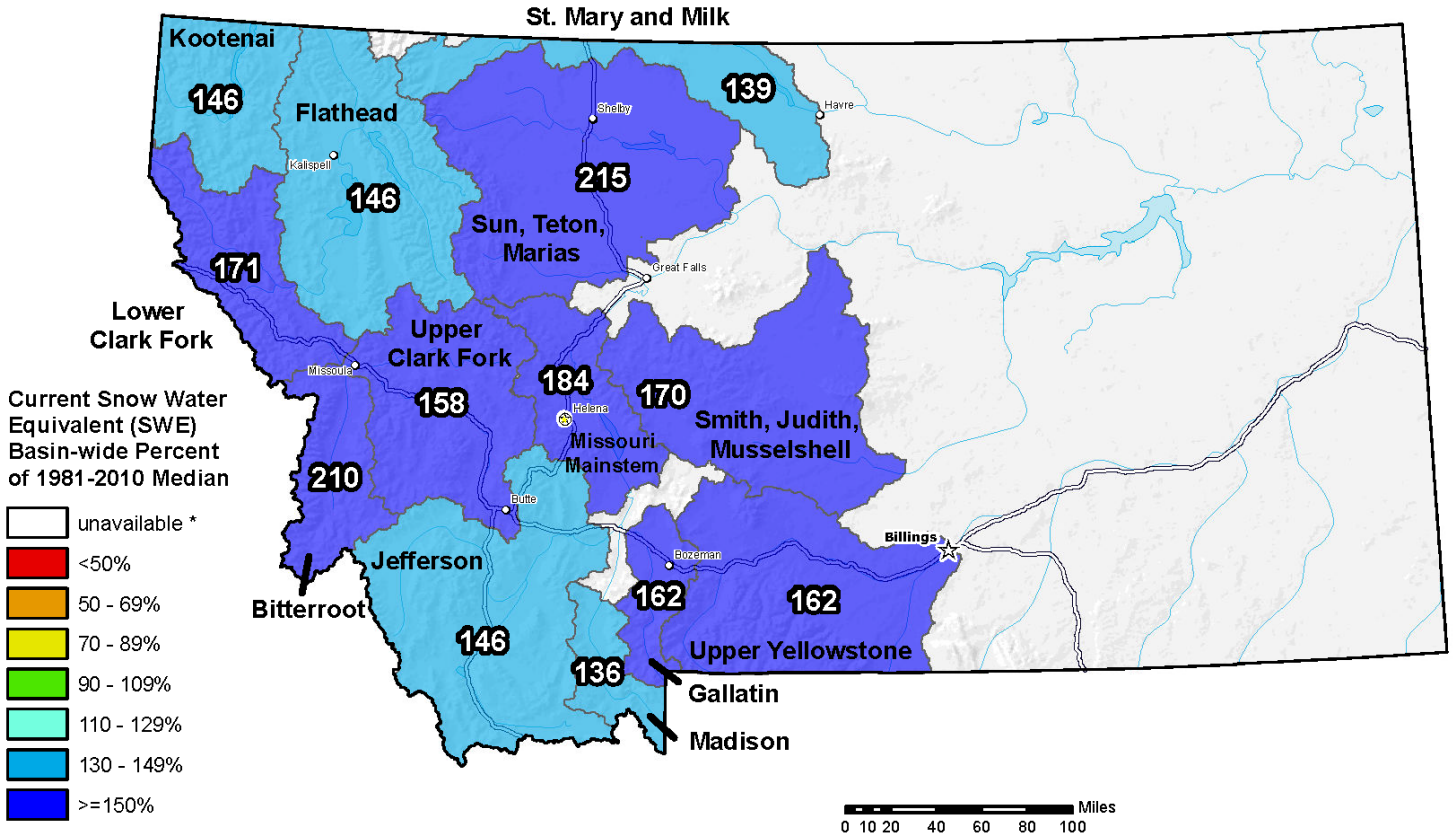
May 15th, 2014

Lucas Zukiewicz
Hydrologist
USDA NRCS Montana Snow Surveys
Lucas.Zukiewicz@mt.usda.gov
(406) 587-6843
http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/

Montana Snow Survey

Montana SNOTEL Current Snow Water Equivalent (SWE) % of Normal

May 14, 2014



Current Snow Water Equivalent (SWE) Basin-wide Percent of 1981-2010 Median

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >=150%

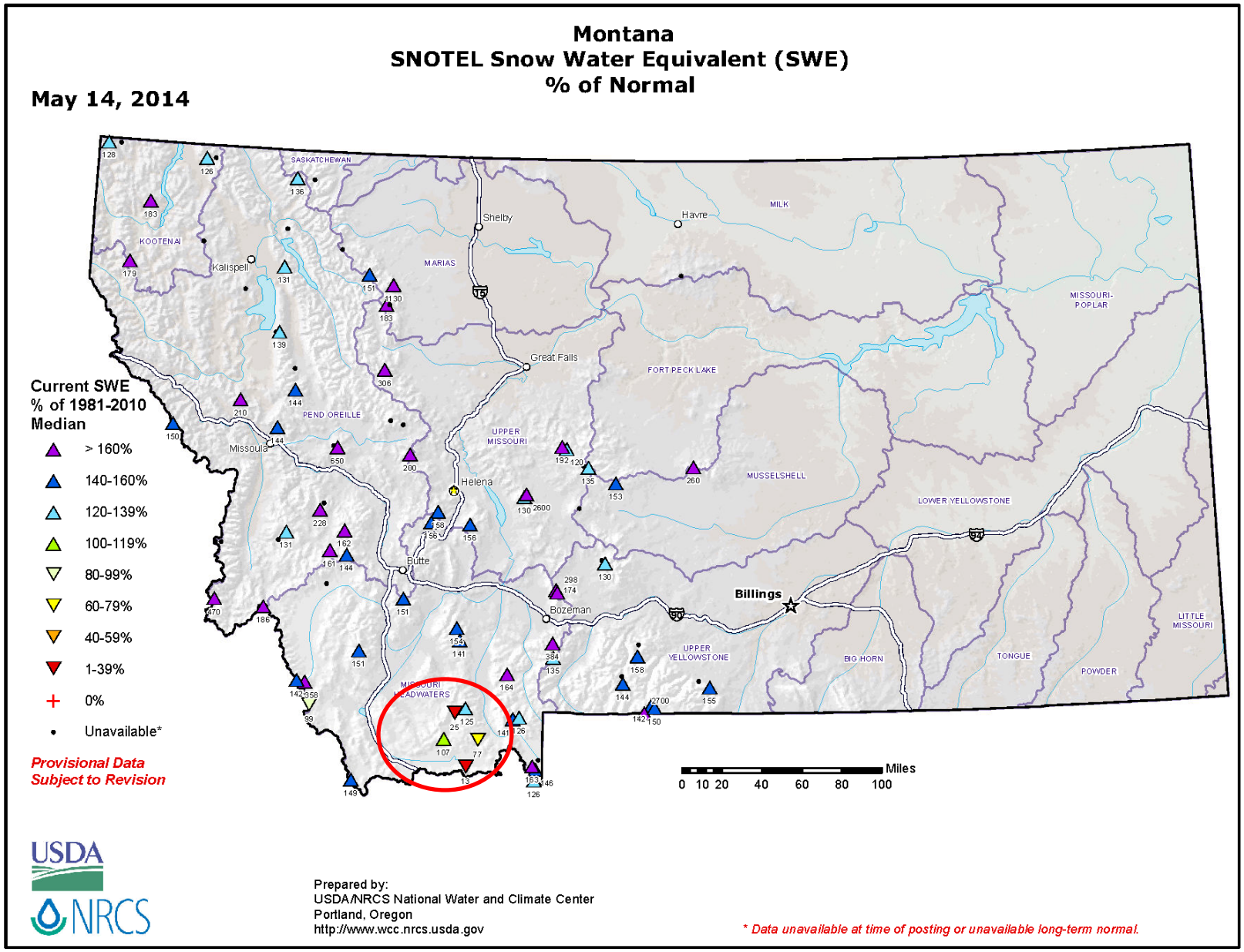
* *Data unavailable at time of posting or measurement is not representative at this time of year*

Provisional Data Subject to Revision

The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov

Montana Snow Survey



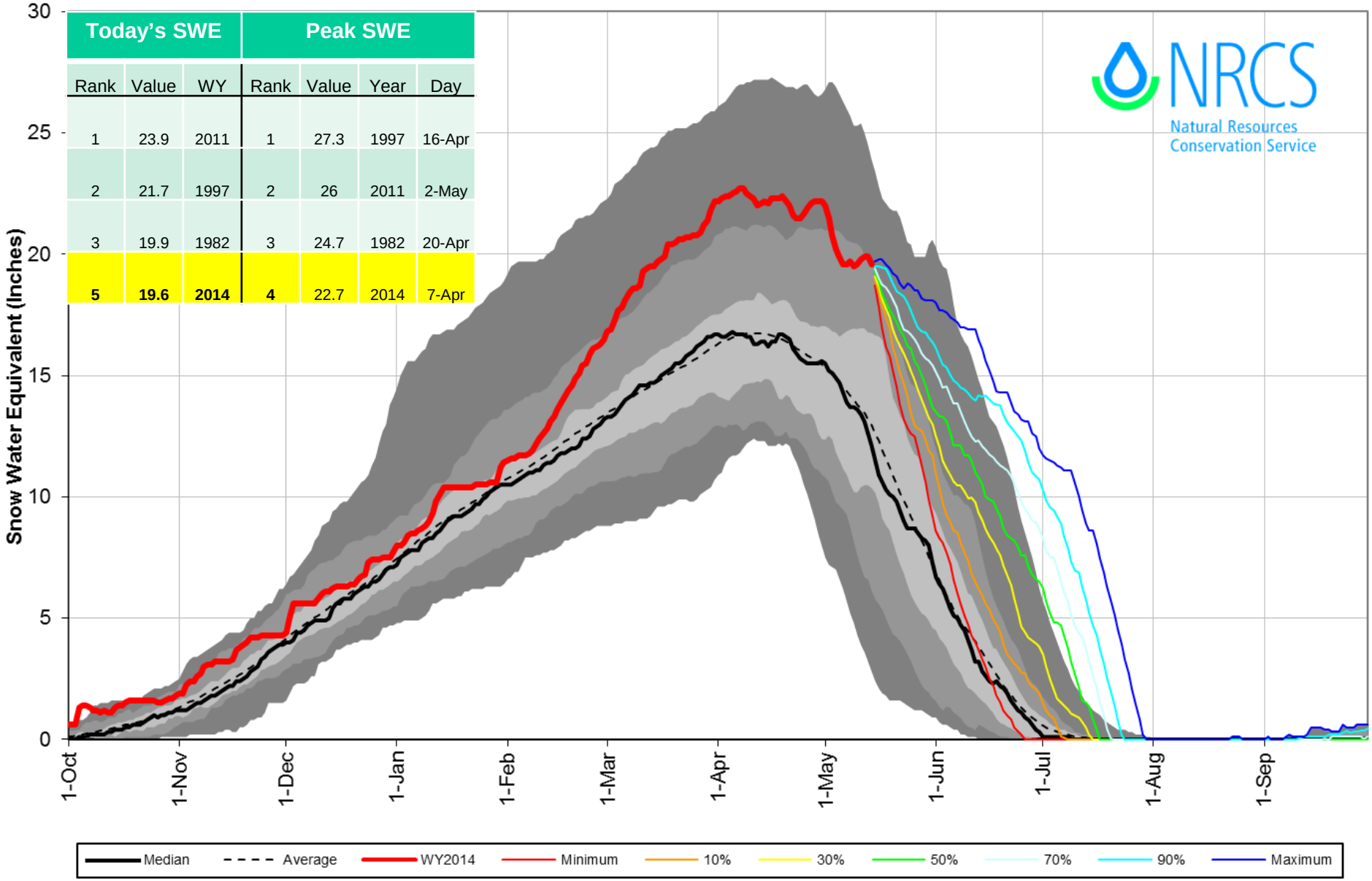
Montana Snow Survey

USDA NRCS

Montana Watersheds with Non-Exceedence Projections

Based on Provisional SNOTEL Data as of May 14, 2014

Today's SWE			Peak SWE			
Rank	Value	WY	Rank	Value	Year	Day
1	23.9	2011	1	27.3	1997	16-Apr
2	21.7	1997	2	26	2011	2-May
3	19.9	1982	3	24.7	1982	20-Apr
5	**19.6**	**2014**	**4**	22.7	2014	7-Apr



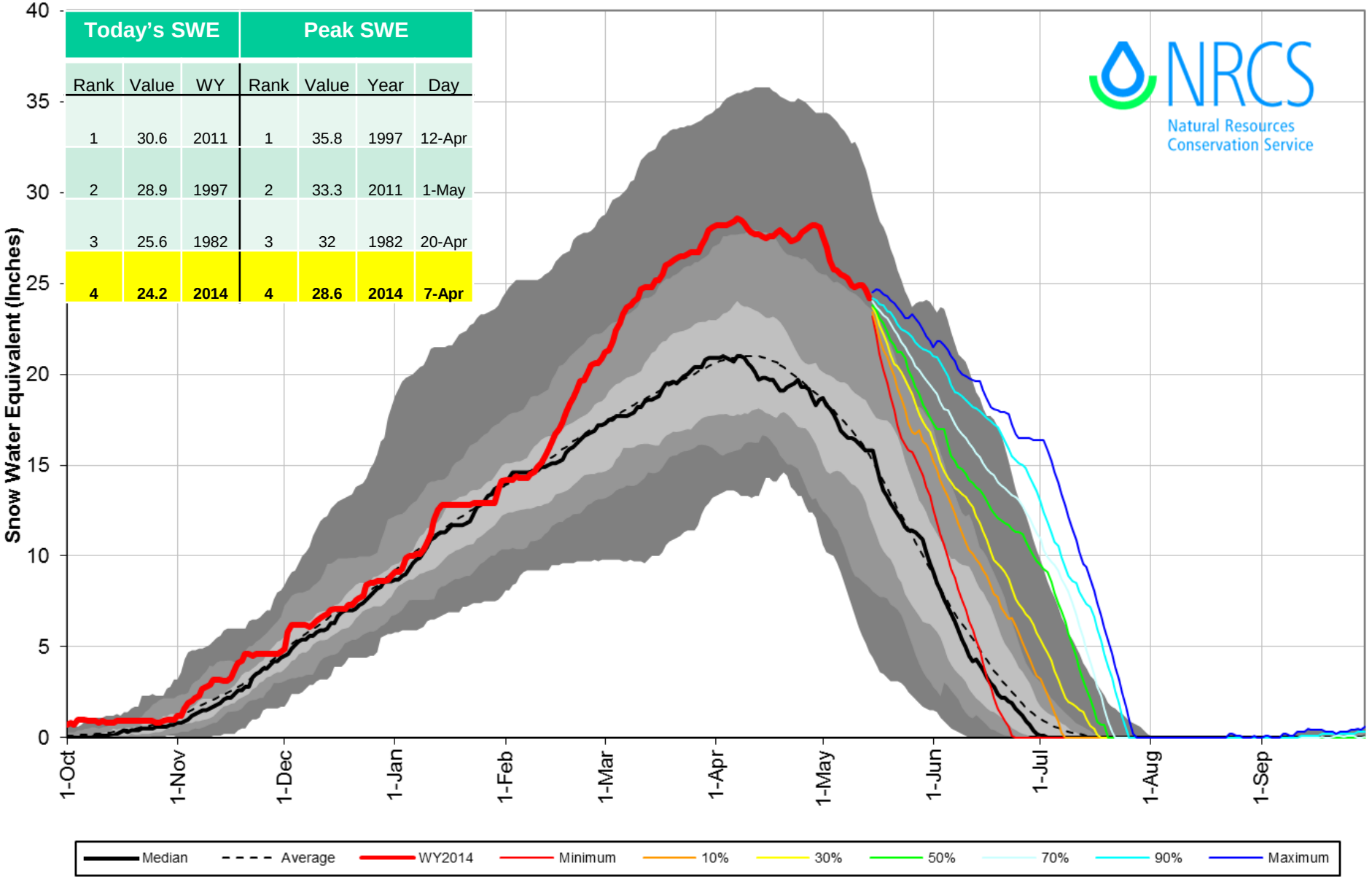
Montana Snow Survey

USDA NRCS

Columbia River Basin in Montana with Non-Exceedence Projections

Based on Provisional SNOTEL Data as of May 14, 2014

Today's SWE			Peak SWE			
Rank	Value	WY	Rank	Value	Year	Day
1	30.6	2011	1	35.8	1997	12-Apr
2	28.9	1997	2	33.3	2011	1-May
3	25.6	1982	3	32	1982	20-Apr
4	**24.2**	**2014**	**4**	**28.6**	**2014**	**7-Apr**



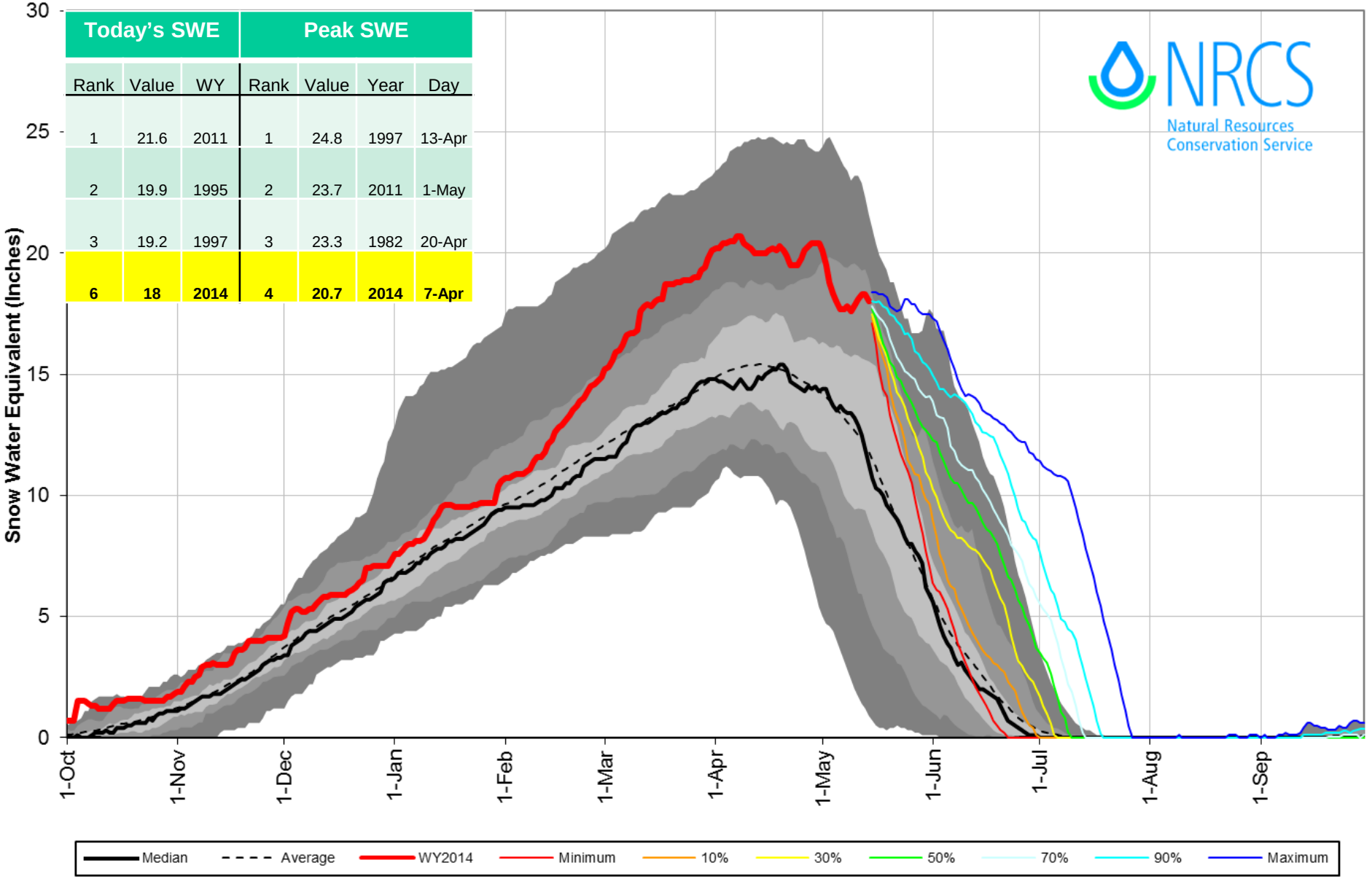
Montana Snow Survey

USDA NRCS

Missouri R. ab Ft. Peck Snowpack with Non-Exceedence Projections

Based on Provisional SNOTEL Data as of May 14, 2014

Today's SWE			Peak SWE			
Rank	Value	WY	Rank	Value	Year	Day
1	21.6	2011	1	24.8	1997	13-Apr
2	19.9	1995	2	23.7	2011	1-May
3	19.2	1997	3	23.3	1982	20-Apr
6	**18**	**2014**	**4**	**20.7**	**2014**	**7-Apr**



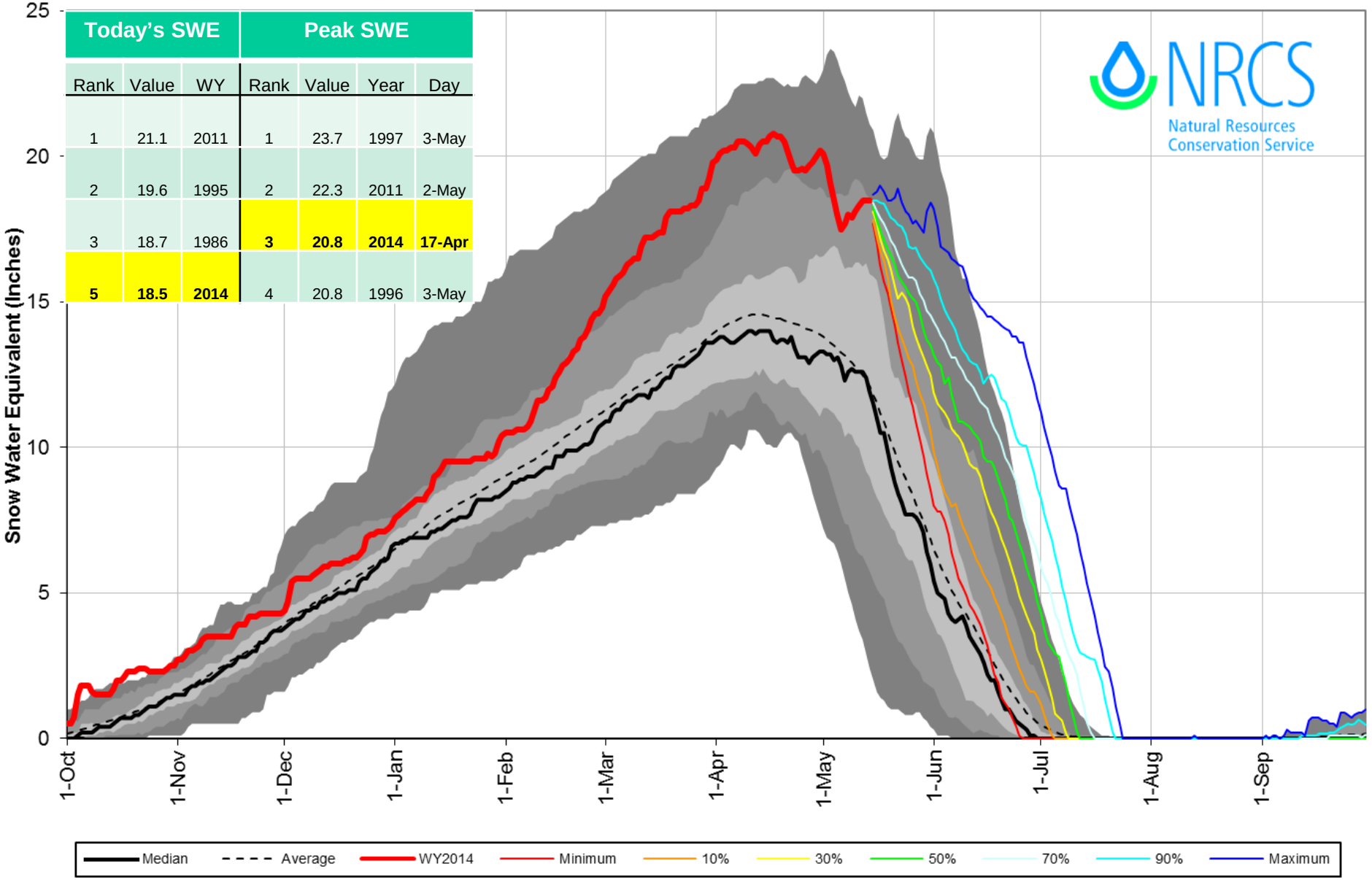
Montana Snow Survey

USDA NRCS

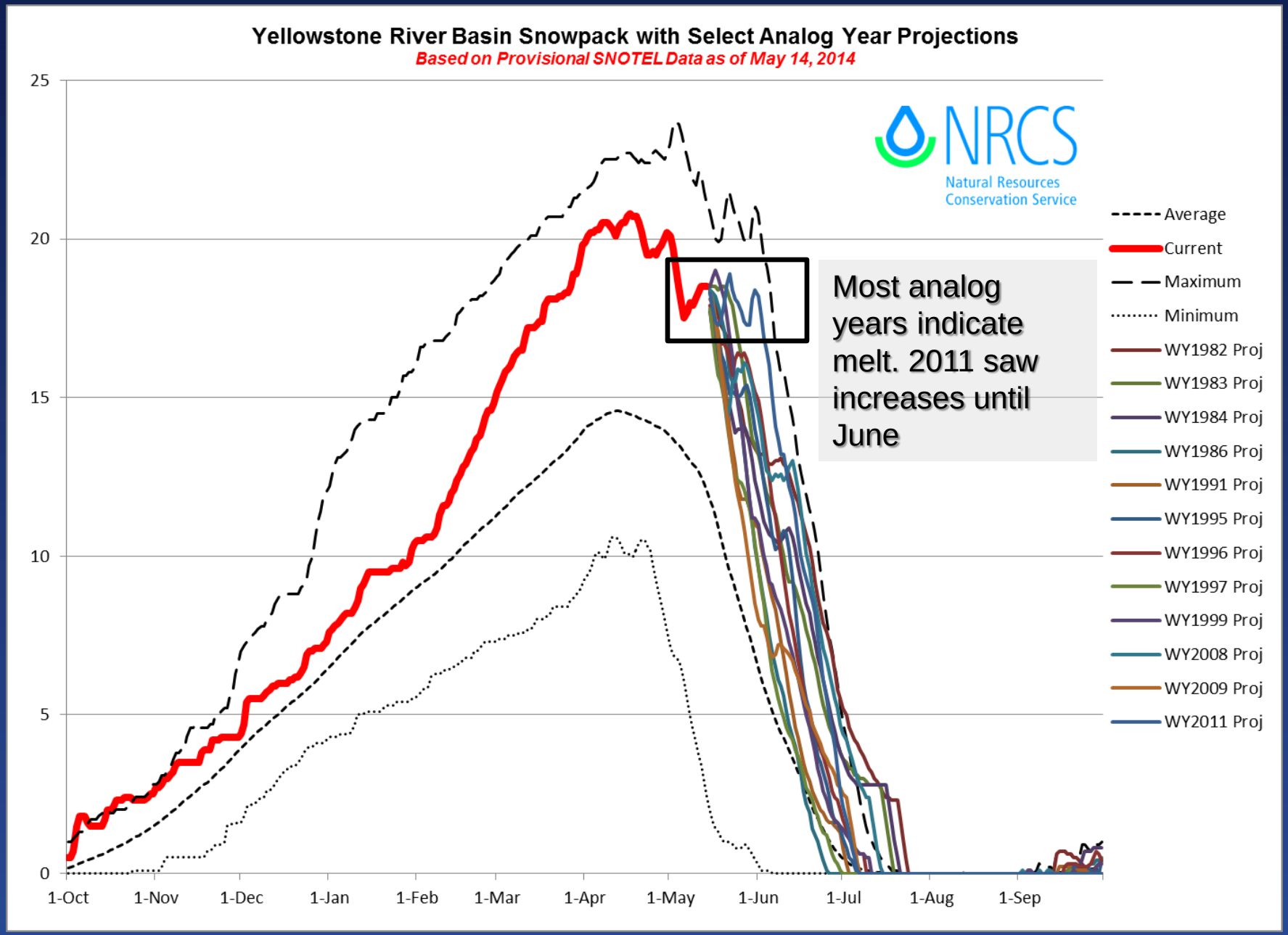
Yellowstone River Basin Snowpack with Non-Exceedence Projections

Based on Provisional SNOTEL Data as of May 14, 2014

Today's SWE			Peak SWE			
Rank	Value	WY	Rank	Value	Year	Day
1	21.1	2011	1	23.7	1997	3-May
2	19.6	1995	2	22.3	2011	2-May
3	18.7	1986	**3**	**20.8**	**2014**	**17-Apr**
5	**18.5**	**2014**	4	20.8	1996	3-May



Montana Snow Survey



Montana Snowpack Summary

Showing Data For 5/14/2014	% Normal	7 Day % Change	Last Year % Normal	Percent of Last Year	% of This Year's Peak	Normal % Peak	% Peak Difference
Columbia In Montana	162%	8%	79%	206%	87%	75%	+12%
East of Divide	153%	15%	64%	240%	88%	82%	+6%
Missouri Headwaters	144%	16%	59%	246%	90%	84%	+6%
Missouri River Basin	154%	17%	60%	256%	87%	79%	+8%
Yellowstone River Basin	154%	13%	67%	230%	89%	85%	+4%
St. Mary & Milk Basin	138%	-19%	104%	133%	74%	72%	+2%
Montana Watersheds	**156%**	**13%**	**69%**	**226%**	**87%**	**79%**	**+8%**

•Considering magnitude of snow this winter snow melt has played out ideally so far, though a bit behind schedule.

•In most basins snowmelt has only started occurring at higher elevation after the first week in May, but low and mid elevations have been actively melting.

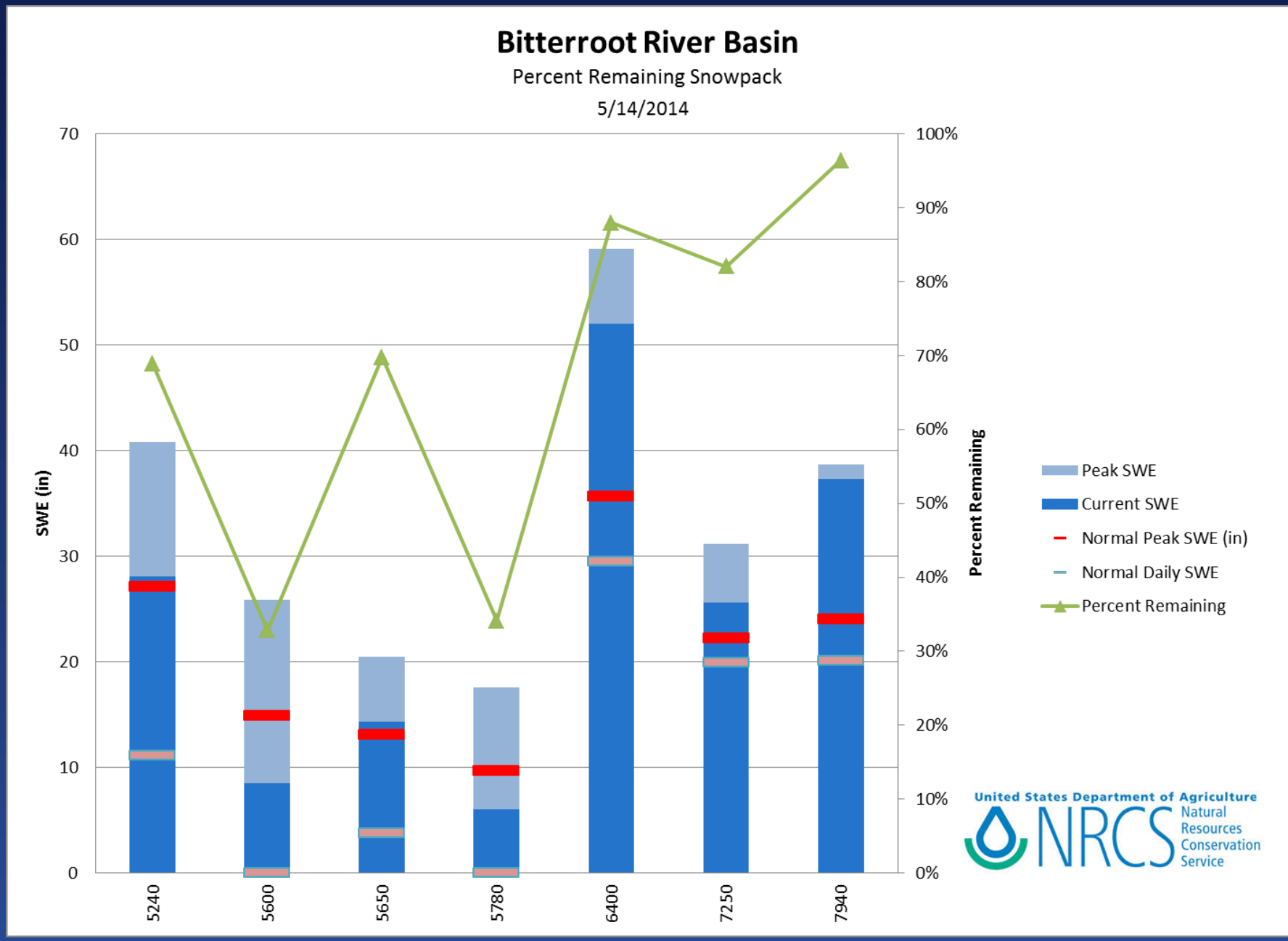
West of the Divide –

- Snowmelt is actively occurring at rates from 0.5-1.0” SWE per day during warming events at low to mid elevations. Higher elevations have not shown much movement, but have started to show response and will begin contributing to hydrograph. Snow melt is delayed compared to normal.

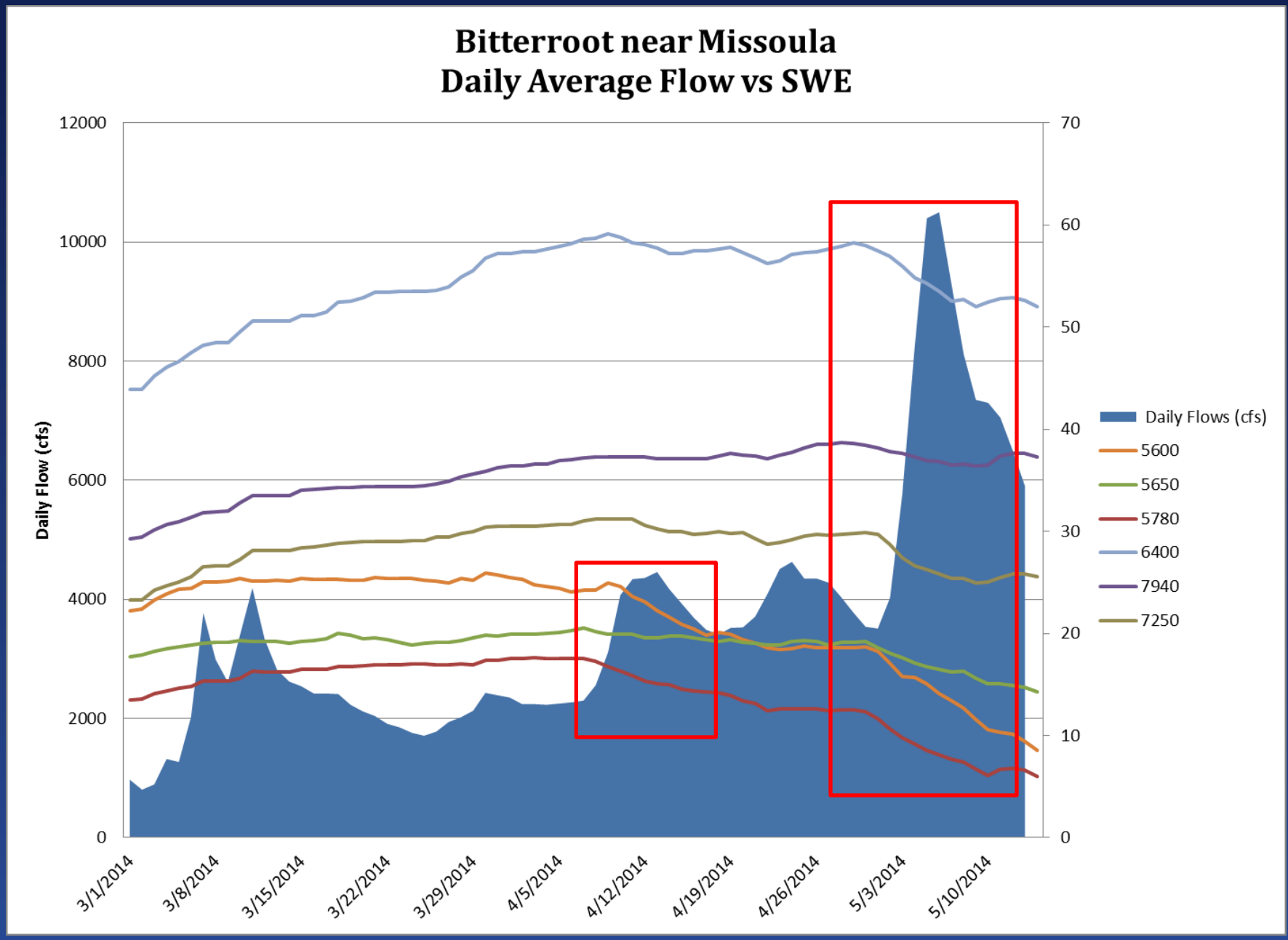
East of the Divide –

- Higher elevation basins may have experienced SWE peak at end of April before the big warm up. Snowmelt is actively occurring during warming events, and slows during cooler periods. High elevations have exhibited little snowmelt to date, but appear to be trending towards a more active melt pattern.

Montana Snow Survey



Montana Snow Survey



Volumetric Streamflow Forecasts

Based on May 1st, 2014 Data

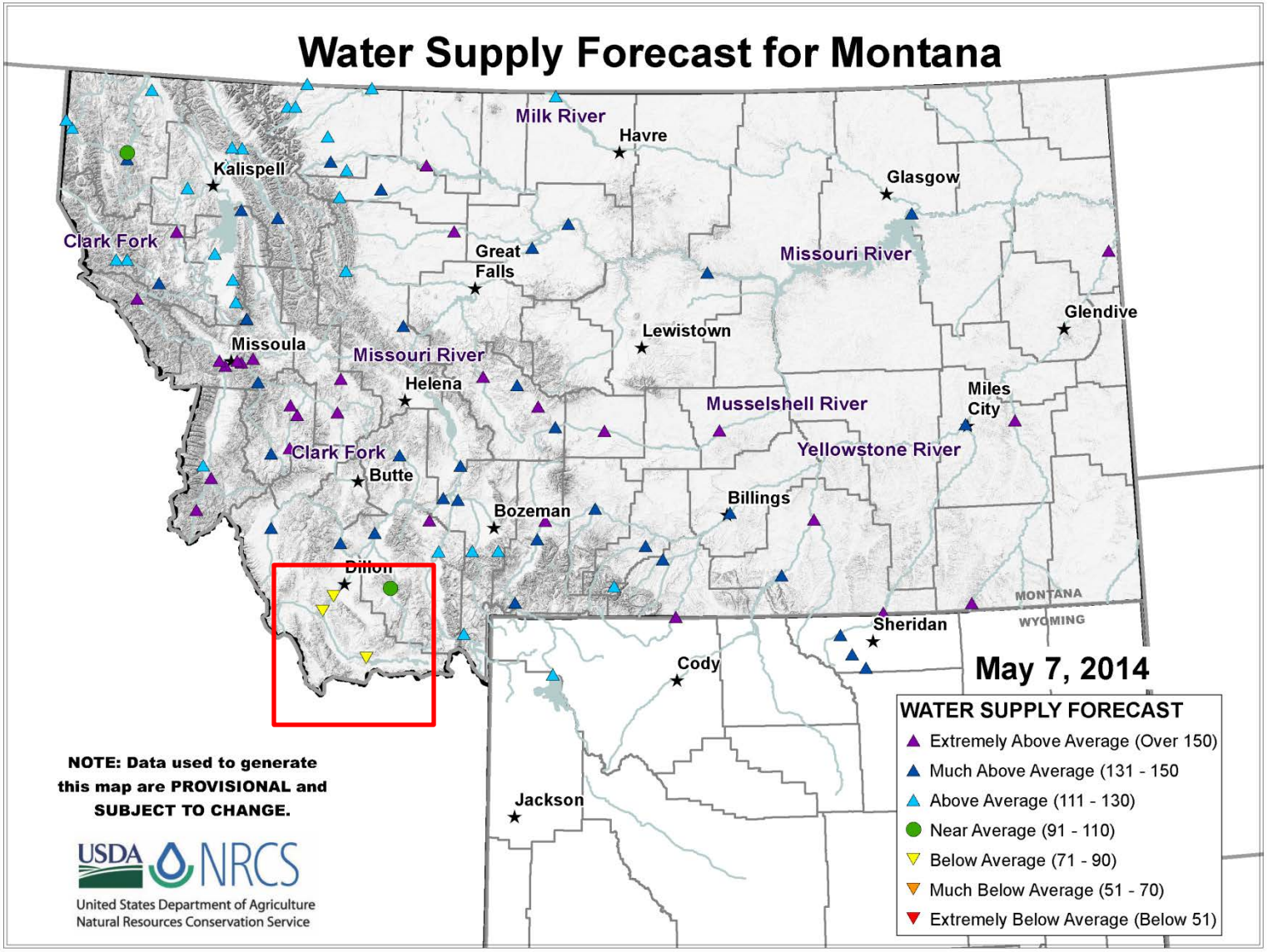
Basin	May-Jul 50% Forecast (KAF)	Average (KAF)	Last Year Obs Streamflow (KAF)	% of Avg	% of Last Year Streamflow
Columbia River Basin	68939.7	51477	53074.0	134%	130%
East Of Divide	61848.6	42986.4	32520.4	144%	190%
Missouri Headwaters Basins	4636	3555.9	1871.2	130%	246%
Missouri Mainstem Basins	29828.6	20624.5	16327.8	145%	182%
Missouri River Basin	34464.6	24180.4	18199.0	143%	189%
Yellowstone River Basin	27384	18806	14321.4	146%	191%
St. Mary	952	884.7	968.3	108%	98%
STATE OF MONTANA	**131740**	**95289.4**	**86500.0**	**138%**	**152%**

***Above numbers are the averages of all forecasts points in the particular basins

- Four forecasts are projected to be “below” average, all in Southwest Montana
  - Ruby River Reservoir Inflow - 94% average
  - Beaverhead River at Barrets - 85% average
  - Clark Canyon Inflow - 80% average
  - Lima Reservoir Inflow - 72% average

- Majority forecasts for individual river systems are predicted to be between 115 to 160% of average. A few individual forecasts above 200% of average, so a close watch is required on timing of flows.

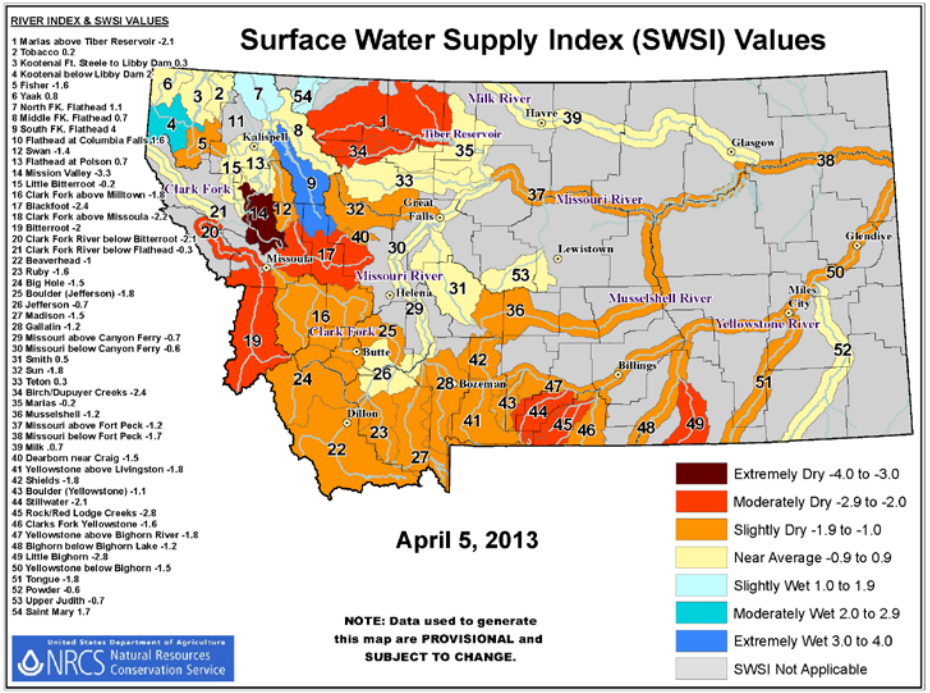
Montana Snow Survey

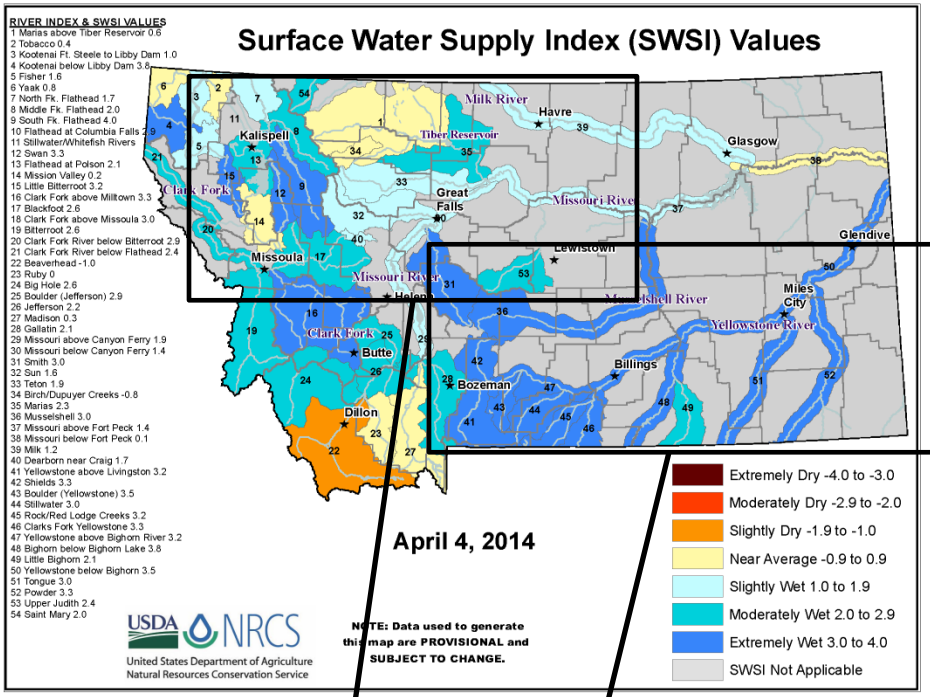


Extremely above average flows May-July

Based on May 1st, 2014 Data

Basin	May-Jul 50% Forecast (KAF)	Average (KAF)	Last Year Obs Streamflow (KAF)	% of Avg	% of Last Year Streamflow
Smith-Judith -Musselshell River Basins	**444.6**	**244.7**	**107.2**	**182%**	**341%**
MUSSELSHELL R AT HARLOWTON	94	48	23.2	196%	406%
MUSSELSHELL R NR ROUNDUP	131	54	19.8	243%	663%
Upper Clark Fork River Basin	**3950.9**	**2469**	**1945.3**	**160%**	**203%**
LOWER WILLOW CK RESERVOIR INFLOW	16	8.5	4.1	188%	391%
NEVADA CK NR HELMVILLE	25	11	5.6	227%	191%
Bitterroot River Basin	**2405**	**1525**	**1159.3**	**158%**	**207%**
WF BITTERROOT R NR CONNER	185	109	82.2	170%	225%


RIVER INDEX & SWSI VALUES
1 Marias above Tiber Reservoir -2.1
2 Tobacco 0.2
3 Kootenai Ft. Steele to Libby Dam 0.3
4 Kootenai below Libby Dam 2.1
5 Fisher -1.6
6 Yaak 0.8
7 North FK. Flathead 1.1
8 Middle FK. Flathead 0.7
9 South FK. Flathead 4
10 Flathead at Columbia Falls -1.6
11 Stillwater/Whitefish Rivers
12 Swan -1.4
13 Flathead at Polson 0.7
14 Mission Valley -3.3
15 Little Bitterroot -0.2
16 Clark Fork above Milltown -1.8
17 Blackfoot -2.4
18 Clark Fork above Missoula -2.2
19 Bitterroot -2
20 Clark Fork River below Bitterroot -2.1
21 Clark Fork River below Flathead -0.3
22 Beaverhead -1
23 Ruby -1.6
24 Big Hole -1.5
25 Boulder (Jefferson) -1.8
26 Jefferson -0.7
27 Madison -1.5
28 Gallatin -1.2
29 Missouri above Canyon Ferry -0.7
30 Missouri below Canyon Ferry -0.6
31 Smith 0.5
32 Sun -1.8
33 Teton 0.3
34 Birch/Dupuyer Creeks -2.4
35 Marias -0.2
36 Musselshell -1.2
37 Missouri above Fort Peck -1.2
38 Missouri below Fort Peck -1.7
39 Milk .0.7
40 Dearborn near Craig -1.5
41 Yellowstone above Livingston -1.8
42 Shields -1.8
43 Boulder (Yellowstone) -1.1
44 Stillwater -2.1
45 Rock/Red Lodge Creeks -2.8
46 Clarks Fork Yellowstone -1.6
47 Yellowstone above Bighorn River -1.8
48 Bighorn below Bighorn Lake -1.2
49 Little Bighorn -2.8
50 Yellowstone below Bighorn -1.5
51 Tongue -1.8
52 Powder -0.6
53 Upper Judith -0.7
54 Saint Mary 1.7
Surface Water Supply Index (SWSI) Values
Milk River
Havre
Tiber Reservoir
Glasgow
Kalispell
Clark Fork
Great Falls
Missouri River
Glendive
Lewistown
Missoula
Missouri River
Helena
Musselshell River
Miles City
Yellowstone River
Clark Fork
Butte
Billings
Bozeman
Dillon
April 5, 2013
NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.
United States Department of Agriculture
NRCS Natural Resources Conservation Service
Extremely Dry -4.0 to -3.0
Moderately Dry -2.9 to -2.0
Slightly Dry -1.9 to -1.0
Near Average -0.9 to 0.9
Slightly Wet 1.0 to 1.9
Moderately Wet 2.0 to 2.9
Extremely Wet 3.0 to 4.0
SWSI Not Applicable


RIVER INDEX & SWSI VALUES
1 Marias above Tiber Reservoir 0.6
2 Tobacco 0.4
3 Kootenai Ft. Steele to Libby Dam 1.0
4 Kootenai below Libby Dam 3.8
5 Fisher 1.6
6 Yaak 0.8
7 North Fk. Flathead 1.7
8 Middle Fk. Flathead 2.0
9 South Fk. Flathead 4.0
10 Flathead at Columbia Falls 2.9
11 Stillwater/Whitefish Rivers
12 Swan 3.3
13 Flathead at Polson 2.1
14 Mission Valley 0.2
15 Little Bitterroot 3.2
16 Clark Fork above Milltown 3.3
17 Blackfoot 2.6
18 Clark Fork above Missoula 3.0
19 Bitterroot 2.6
20 Clark Fork River below Bitterroot 2.9
21 Clark Fork River below Flathead 2.4
22 Beaverhead -1.0
23 Ruby 0
24 Big Hole 2.6
25 Boulder (Jefferson) 2.9
26 Jefferson 2.2
27 Madison 0.2
28 Gallatin 2.1
29 Missouri above Canyon Ferry 1.9
30 Missouri below Canyon Ferry 1.4
31 Smith 3.0
32 Sun 1.6
33 Teton 1.9
34 Birch/Dupuyer Creeks -0.8
35 Marias 2.3
36 Musselshell 3.0
37 Missouri above Fort Peck 1.4
38 Missouri below Fort Peck 0.1
39 Milk 1.2
40 Dearborn near Craig 1.7
41 Yellowstone above Livingston 3.2
42 Shields 3.3
43 Boulder (Yellowstone) 3.5
44 Stillwater 3.0
45 Rock/Red Lodge Creeks 3.2
46 Clarks Fork Yellowstone 3.3
47 Yellowstone above Bighorn River 3.2
48 Bighorn below Bighorn Lake 3.8
49 Little Bighorn 2.1
50 Yellowstone below Bighorn 3.5
51 Tongue 3.0
52 Powder 3.3
53 Upper Judith 2.4
54 Saint Mary 2.0
Surface Water Supply Index (SWSI) Values
Milk River
Havre
Tiber Reservoir
Glasgow
Kalispell
Clark Fork
Great Falls
Missouri River
Glendive
Lewistown
Missoula
Missouri River
Helena
Musselshell River
Miles City
Yellowstone River
Clark Fork
Butte
Billings
Bozeman
Dillon
April 4, 2014
USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service
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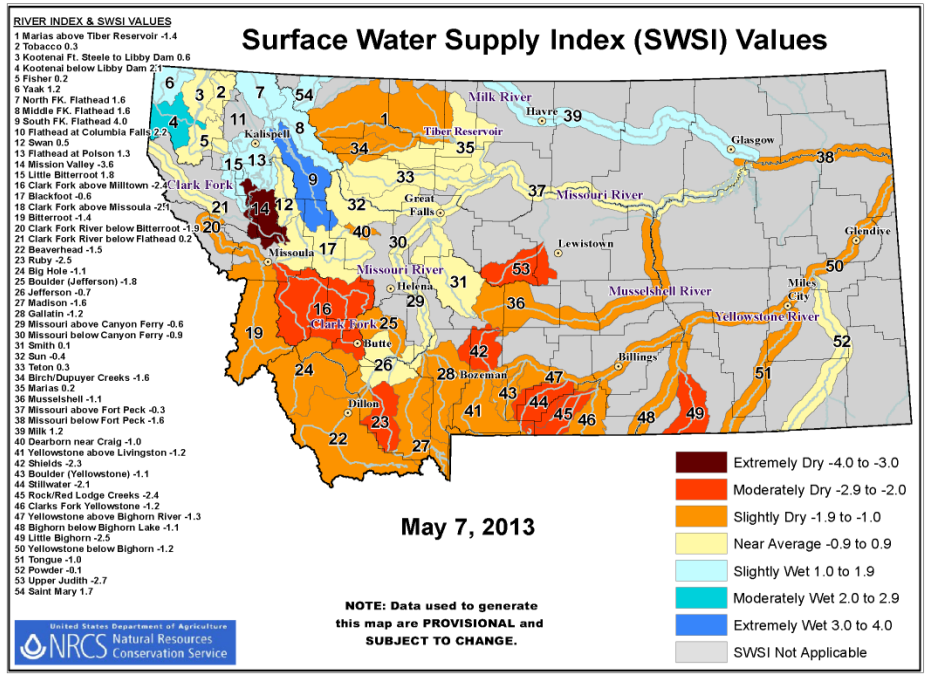
Extremely Dry -4.0 to -3.0
Moderately Dry -2.9 to -2.0
Slightly Dry -1.9 to -1.0
Near Average -0.9 to 0.9
Slightly Wet 1.0 to 1.9
Moderately Wet 2.0 to 2.9
Extremely Wet 3.0 to 4.0
SWSI Not Applicable


RIVER INDEX & SWSI VALUES
1 Marias above Tiber Reservoir -1.4
2 Tobacco 0.3
3 Kootenai Ft. Steele to Libby Dam 0.6
4 Kootenai below Libby Dam 2.1
5 Fisher 0.2
6 Yaak 1.2
7 North FK. Flathead 1.6
8 Middle FK. Flathead 1.6
9 South FK. Flathead 4.0
10 Flathead at Columbia Falls 2.2
11 Swan 0.5
13 Flathead at Polson 1.3
14 Mission Valley -3.6
15 Little Bitterroot 1.8
16 Clark Fork above Milltown -2.4
17 Blackfoot -0.6
18 Clark Fork above Missoula -2.5
19 Bitterroot -1.4
20 Clark Fork River below Bitterroot -1.9
21 Clark Fork River below Flathead 0.2
22 Beaverhead -1.5
23 Ruby -2.5
24 Big Hole -1.1
25 Boulder (Jefferson) -1.8
26 Jefferson -0.7
27 Madison -1.0
28 Gallatin -1.2
29 Missouri above Canyon Ferry -0.6
30 Missouri below Canyon Ferry -0.9
31 Smith 0.1
32 Sun -0.4
33 Teton 0.3
34 Birch/Dupuyer Creeks -1.6
35 Marias 0.2
36 Musselshell -1.1
37 Missouri above Fort Peck -0.3
38 Missouri below Fort Peck -1.6
39 Milk 1.2
40 Dearborn near Craig -1.0
41 Yellowstone above Livingston -1.2
42 Shields -2.3
43 Boulder (Yellowstone) -1.1
44 Stillwater -2.1
45 Rock/Red Lodge Creeks -2.4
46 Clarks Fork Yellowstone -1.2
47 Yellowstone above Bighorn River -1.3
48 Bighorn below Bighorn Lake -1.1
49 Little Bighorn -2.5
50 Yellowstone below Bighorn -1.2
51 Tongue -1.0
52 Powder -0.1
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Clark Fork
Butte
Billings
Bozeman
Dillon
May 7, 2013
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United States Department of Agriculture
NRCS Natural Resources Conservation Service
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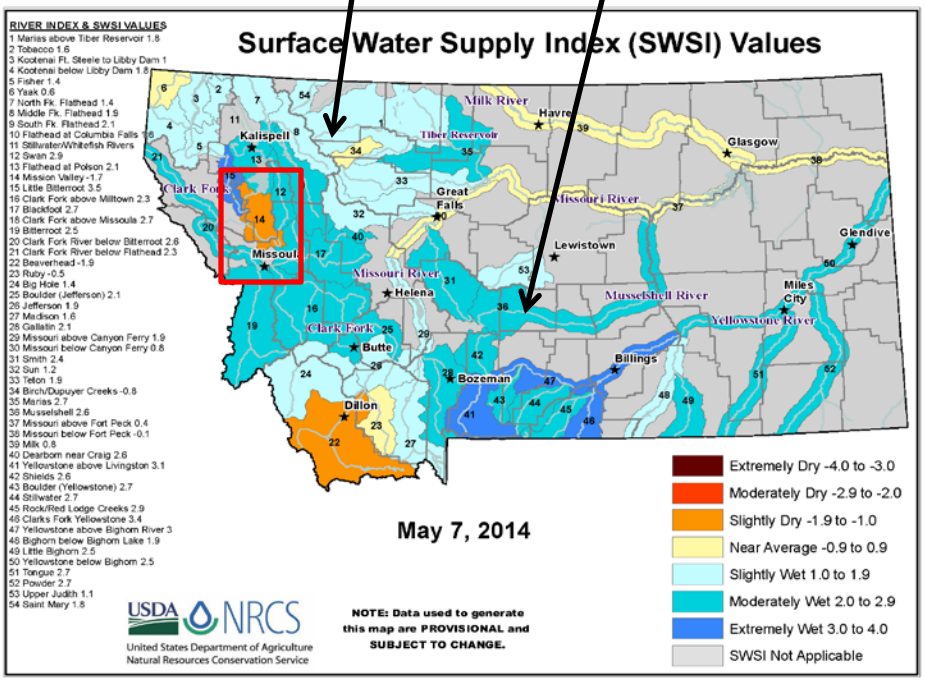
RIVER INDEX & SWSI VALUES
1 Marias above Tiber Reservoir 1.8
2 Tobacco 1.6
3 Kootenai Ft. Steele to Libby Dam 1
4 Kootenai below Libby Dam 1.8
5 Fisher 1.4
6 Yaak 0.6
7 North Fk. Flathead 1.4
8 Middle Fk. Flathead 1.9
9 South Fk. Flathead 2.1
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18 Clark Fork above Missoula 2.7
19 Bitterroot 2.5
20 Clark Fork River below Bitterroot 2.6
21 Clark Fork River below Flathead 2.3
22 Beaverhead -1.9
23 Ruby -0.5
24 Big Hole 1.4
25 Boulder (Jefferson) 2.1
26 Jefferson 1.9
27 Madison 1.6
28 Gallatin 2.1
29 Missouri above Canyon Ferry 1.9
30 Missouri below Canyon Ferry 0.8
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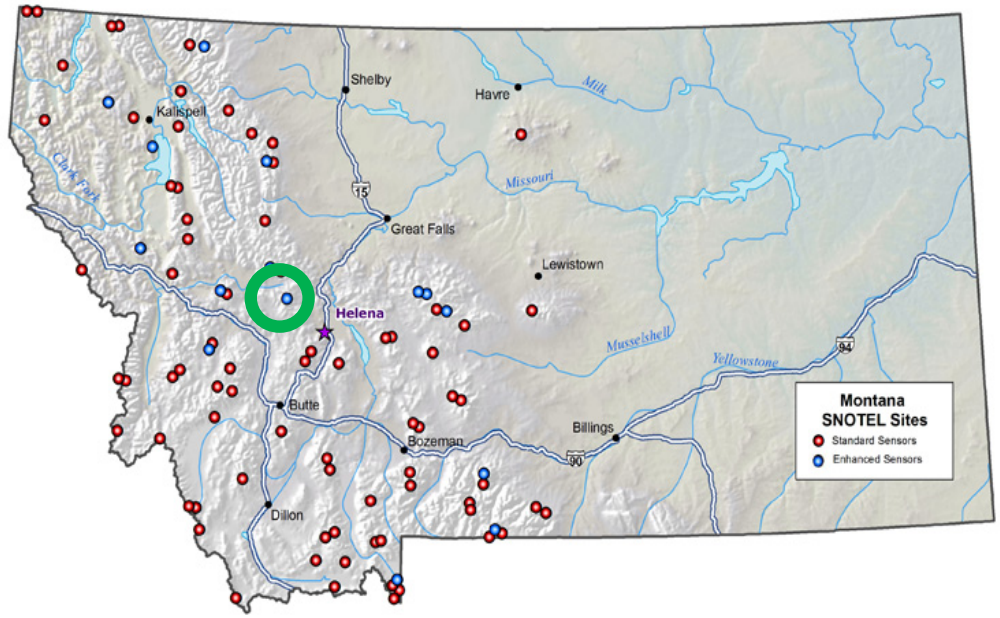
Extremely Wet 3.0 to 4.0
SWSI Not Applicable

Montana Snow Survey

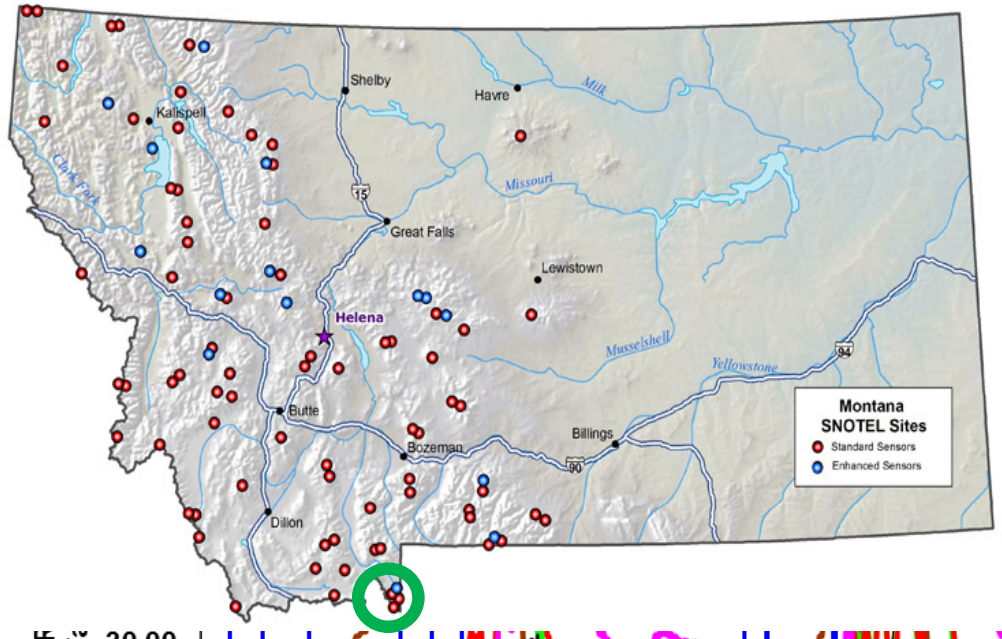
USDA NRCS



Water Year 2011-14
sponse Data

Montana Snow Survey

USDA NRCS



Vater Year 2011-14
sponse Data

Montana Snow Survey

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nse Data

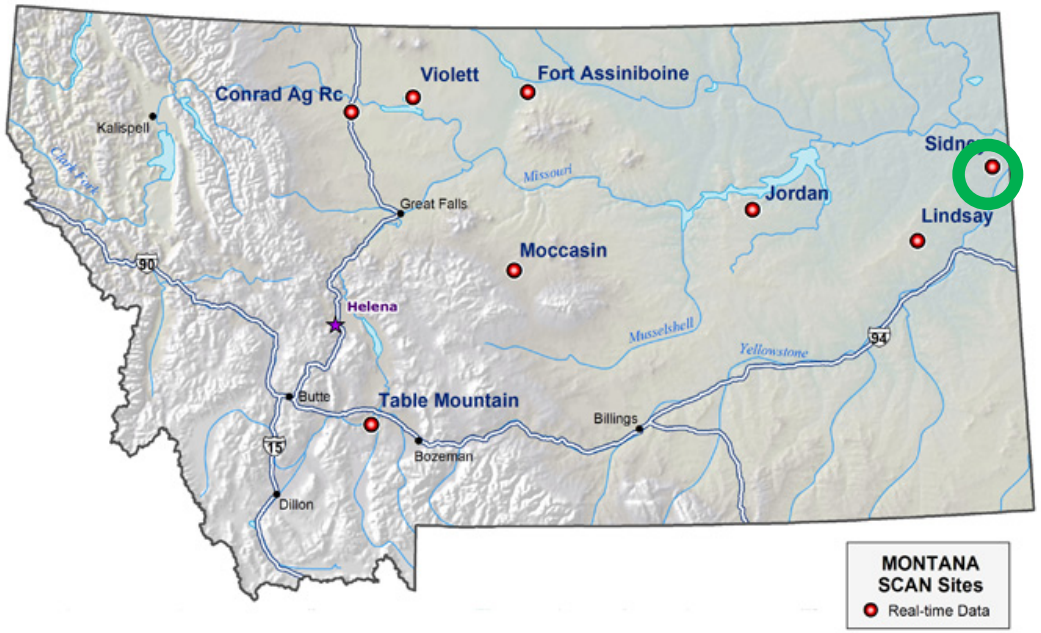
Montana Snow Survey

Year 2011-14
onse Data

Avg 20" SMR Avg 40" SMR

Montana Snow Survey

USDA NRCS



ear 2011-14
onse Data

Grass Avg 8" SMR — Grass Avg 20" SMR
Field Avg 40" SMR

Soil Moisture

25.0
20.0
15.0
10.0
5.0
0.0

2.5
2.3
2.0
1.8
1.5
1.3
1.0
0.8
0.5
0.3
0.0

Daily Precipitation (inches)

10/01/10
11/26/10
01/21/11
03/18/11
05/13/11
07/08/11
09/02/11
10/28/11
12/23/11
02/17/12
04/13/12
06/08/12
08/03/12
09/28/12
11/23/12
01/18/13
03/15/13
05/10/13
07/05/13
08/30/13
10/25/13
12/20/13
02/14/14
04/11/14

Date

Summary

- Snowpack melt timing is pretty close to a normal rate for this time of year, although it was delayed slightly in April.
  - Warm & Sunny weather followed by periods of cooler cloudier (and some snow) has been ideal in compartmentalizing snowmelt to certain elevations.
  - Given the volume of snow water equivalent we accumulated this winter, this pattern has been the best case scenario

- Basin percentages of normal are now relating to a “normally” melting snowpack. Significantly above percentages indicate the above normal winter snowfall and delayed/slow basin melt rates.

- Streamflow response to significant snowmelt has been limited until after the early part of May. Low to Mid elevation melt has driven the flows we have experienced. Higher elevations are yet to come.

- May-July streamflow forecasts indicate well above average stream flows for the period. Most basins range from 115 to 160% of average with a few that are significantly higher. Consult the May 1st Water Supply Outlook Report for more detailed information.

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/snow/?cid=nrcs144p2_057799

Montana Snow Survey

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Governor's Drought & Water Supply Advisory Committee

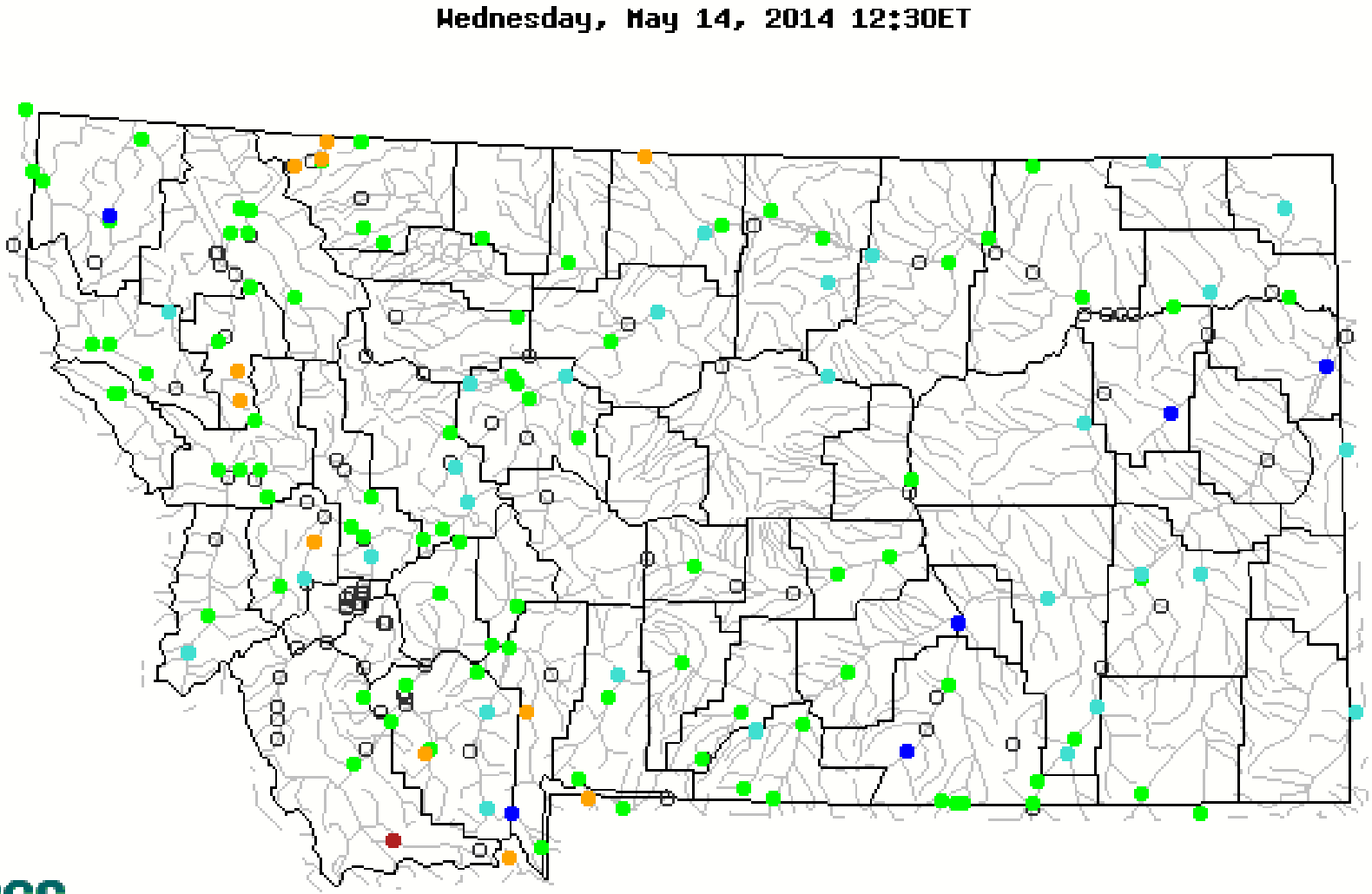
Snow Survey and Water Supply Report

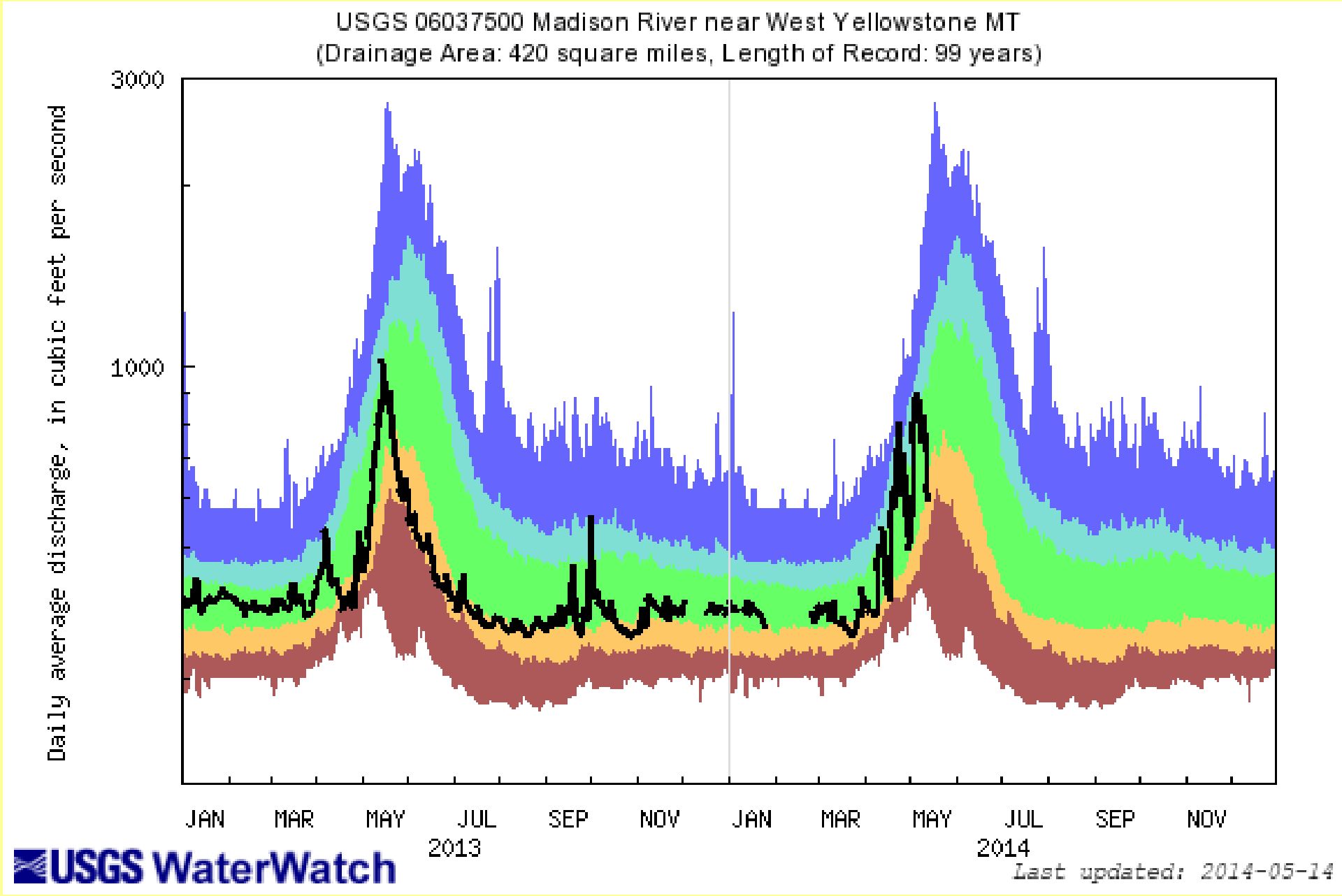
May 15th, 2014

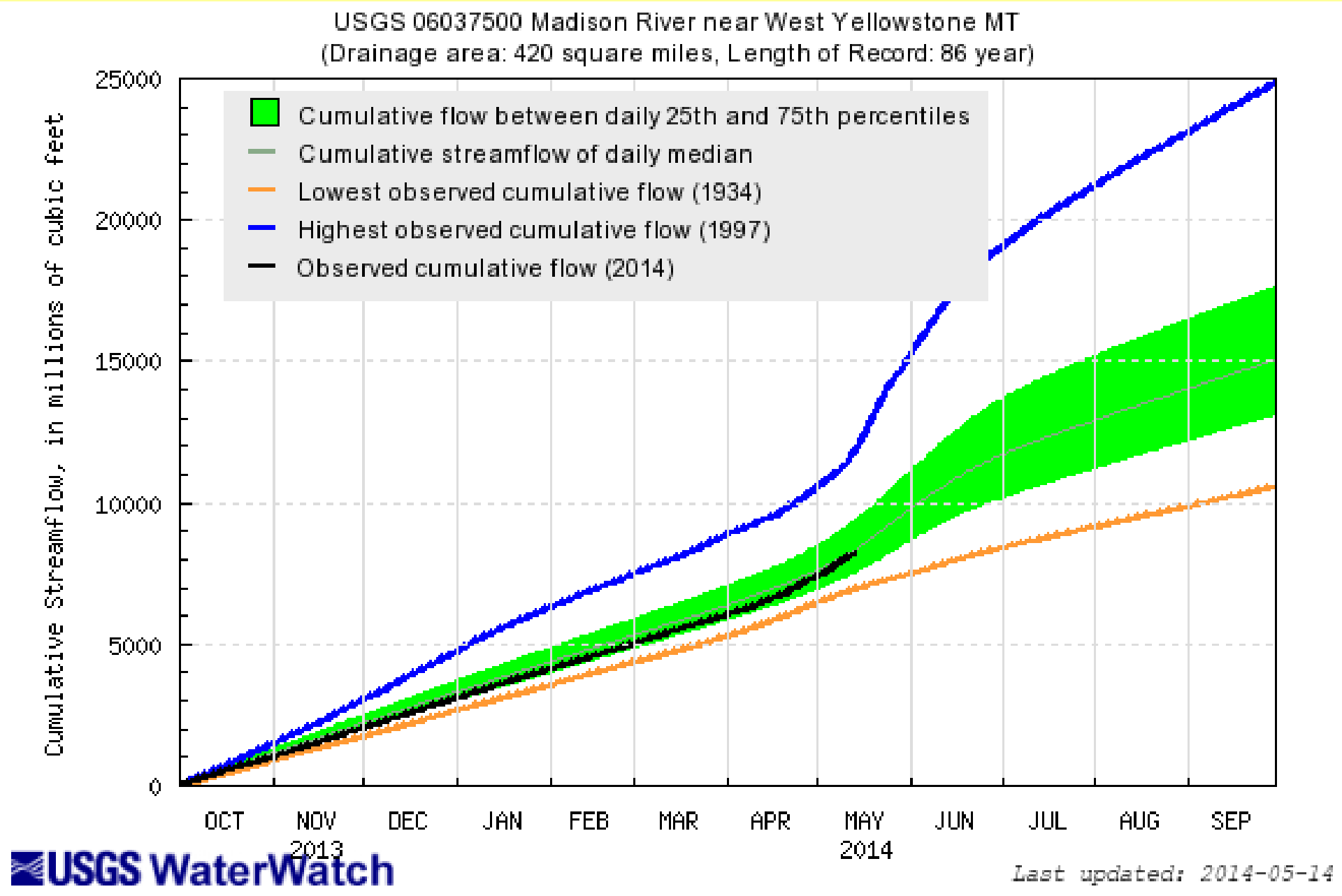
Lucas Zukiewicz
Hydrologist
USDA NRCS Montana Snow Surveys
Lucas.Zukiewicz@mt.usda.gov
(406) 587-6843
http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/

USGS Streamflows, May 2014

DAILY STREAMFLOW CONDITIONS

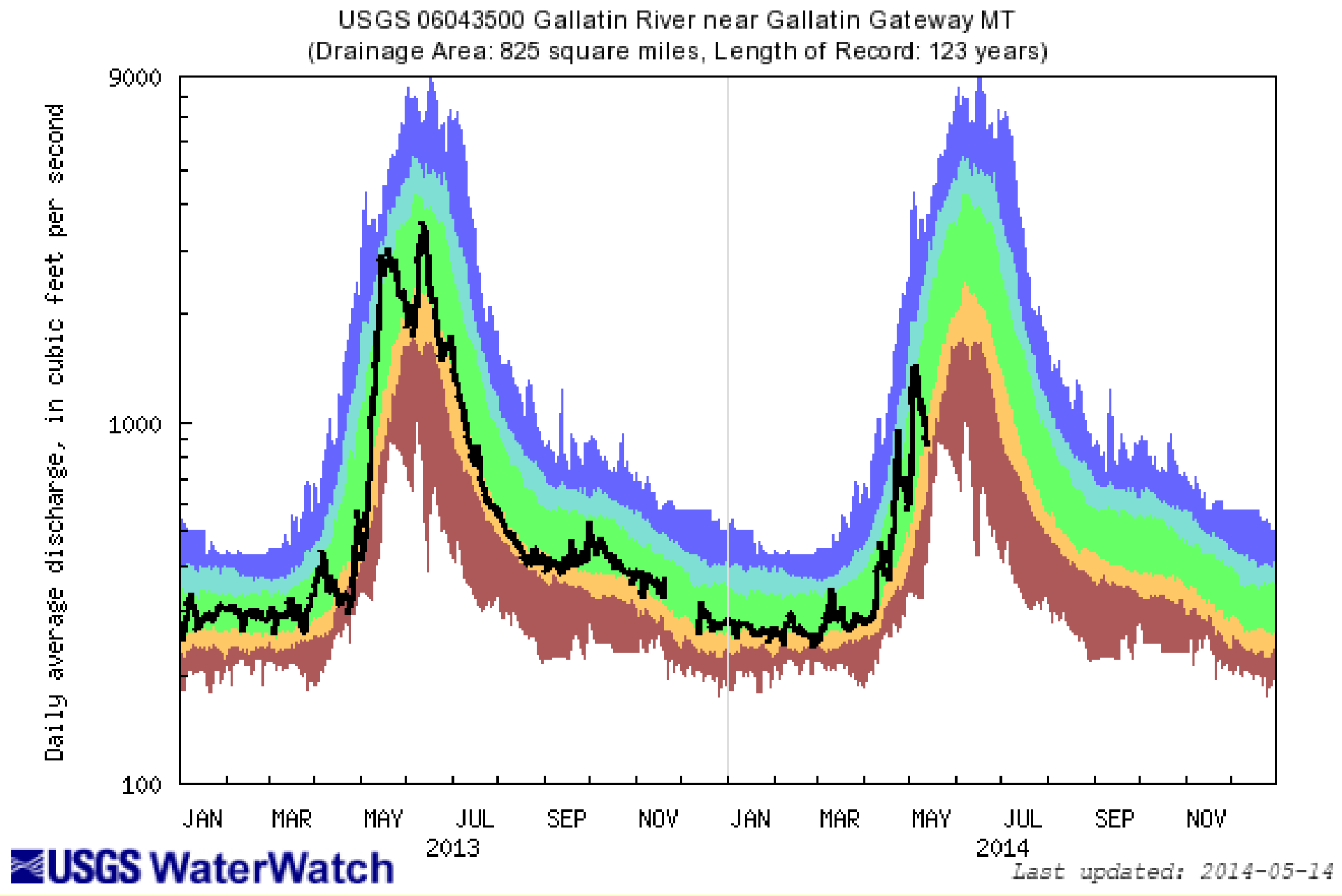


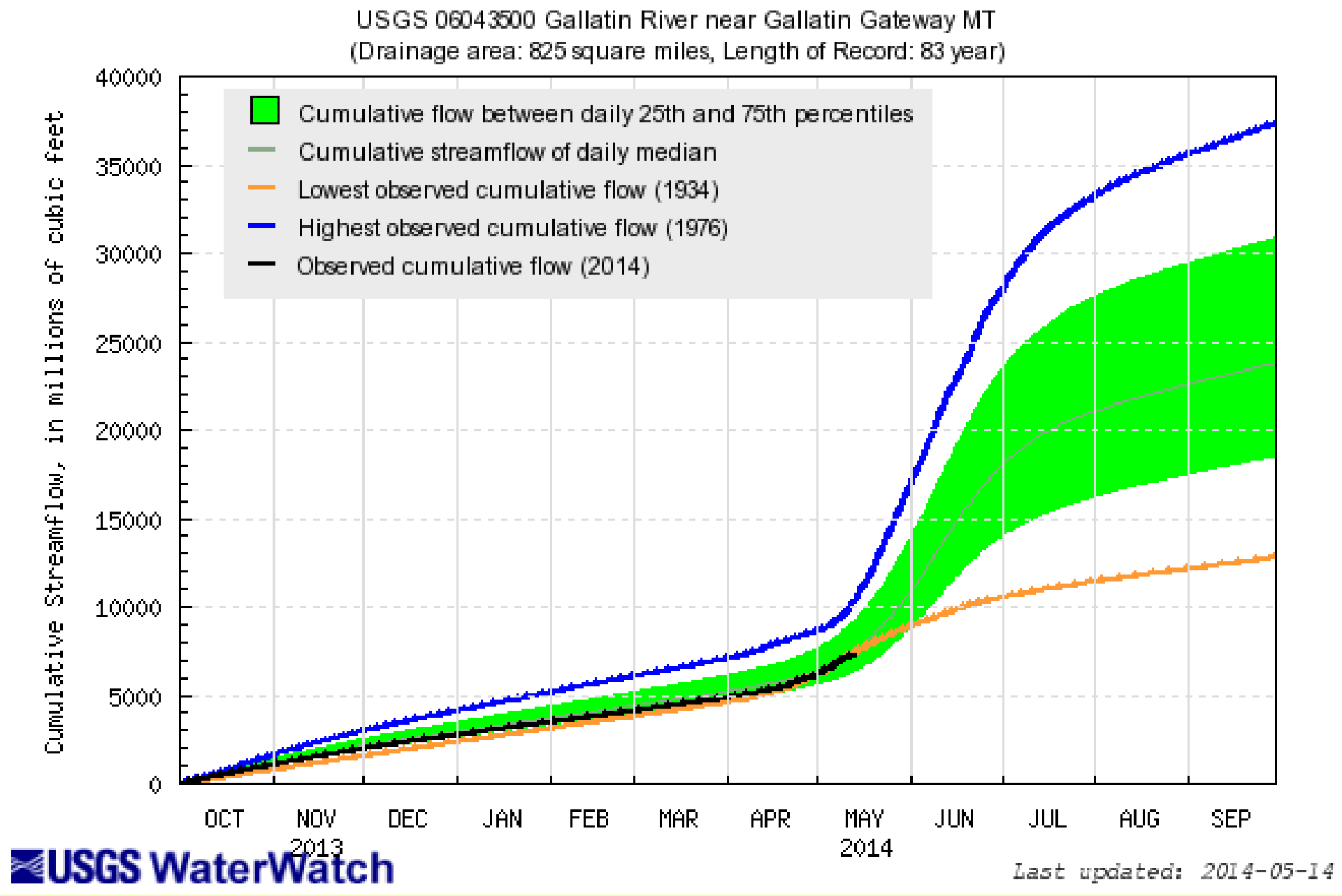

USGS 06037500 Madison River near West Yellowstone MT
(Drainage Area: 420 square miles, Length of Record: 99 years)
Daily average discharge, in cubic feet per second
3000
1000
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

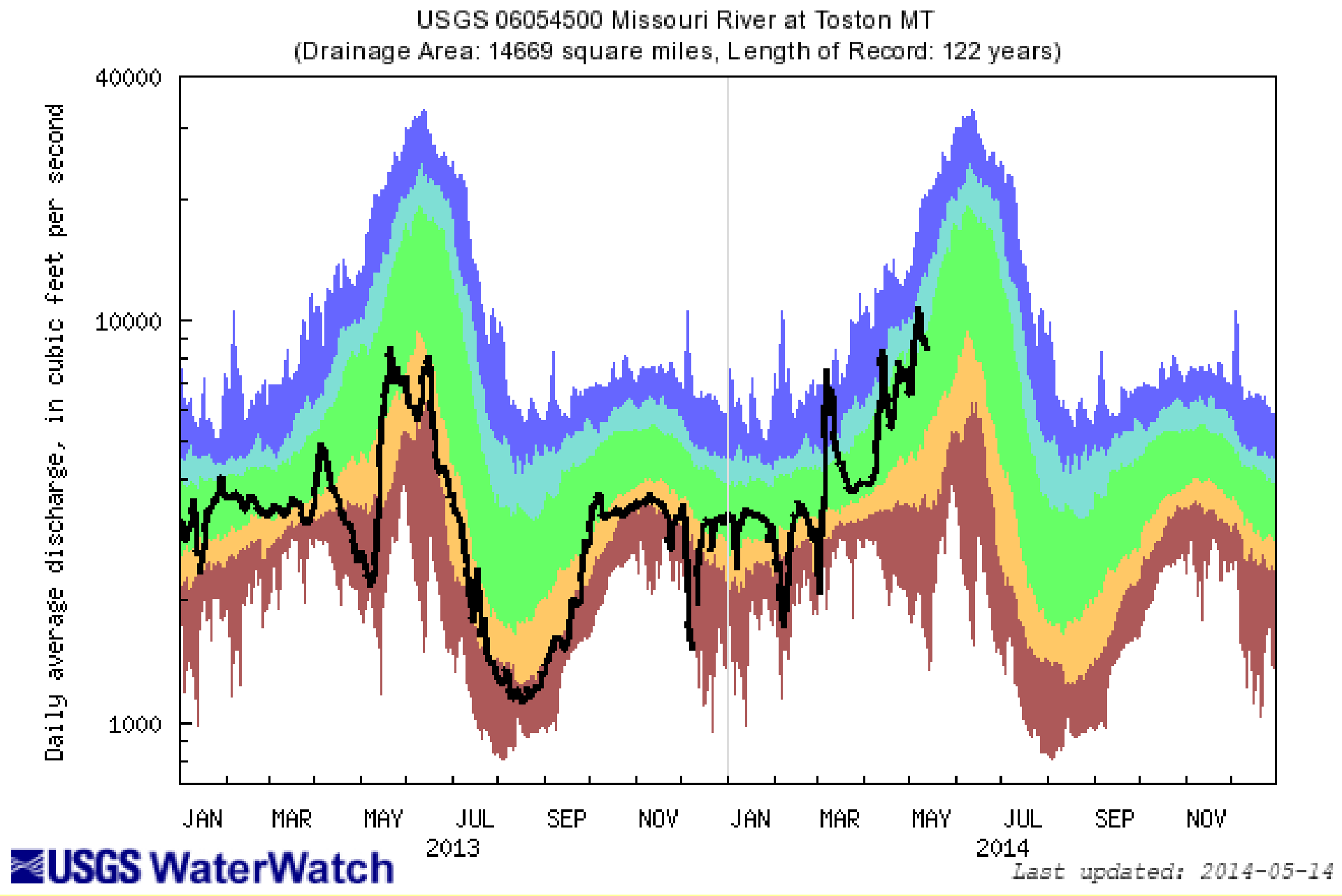


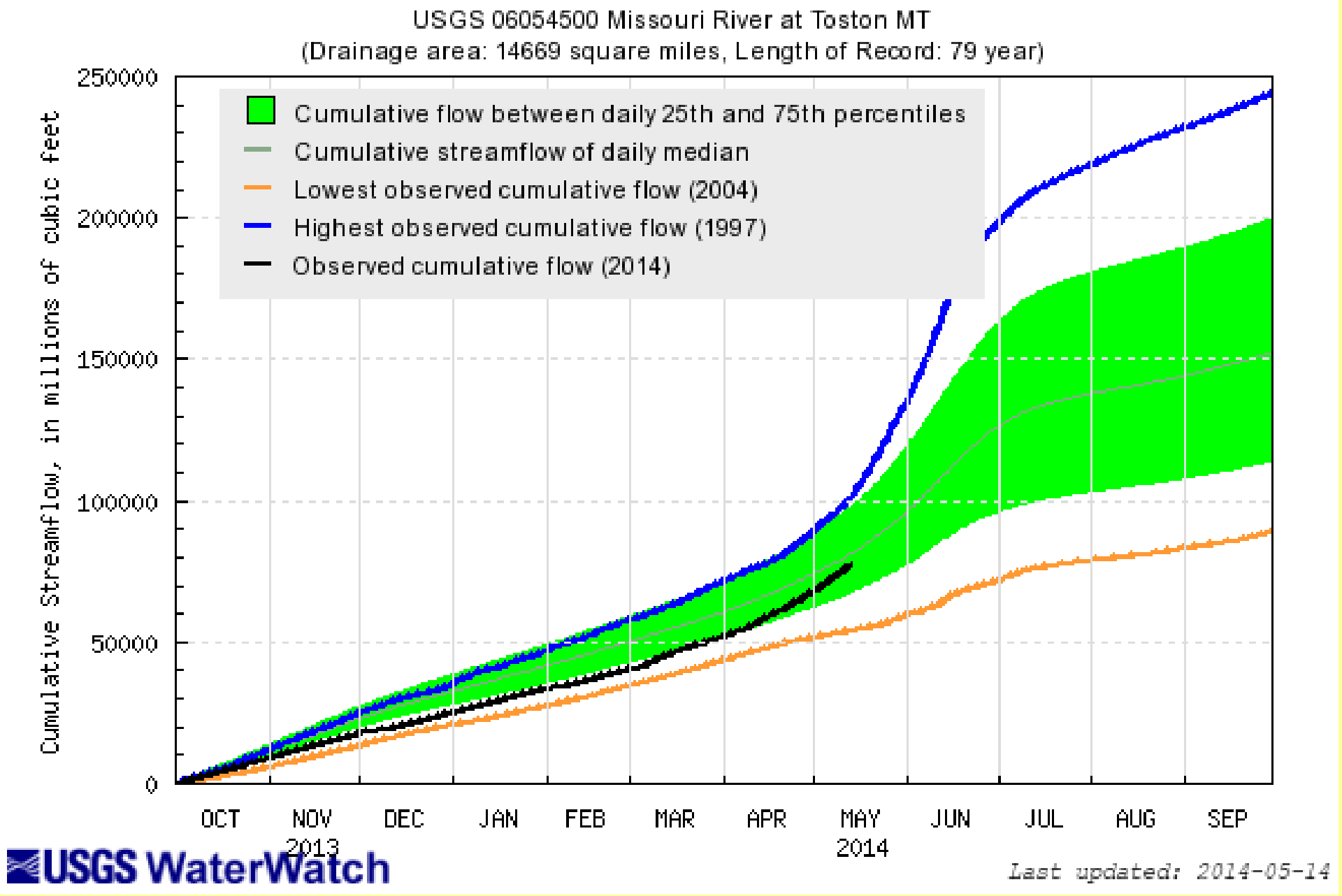
USGS WaterWatch

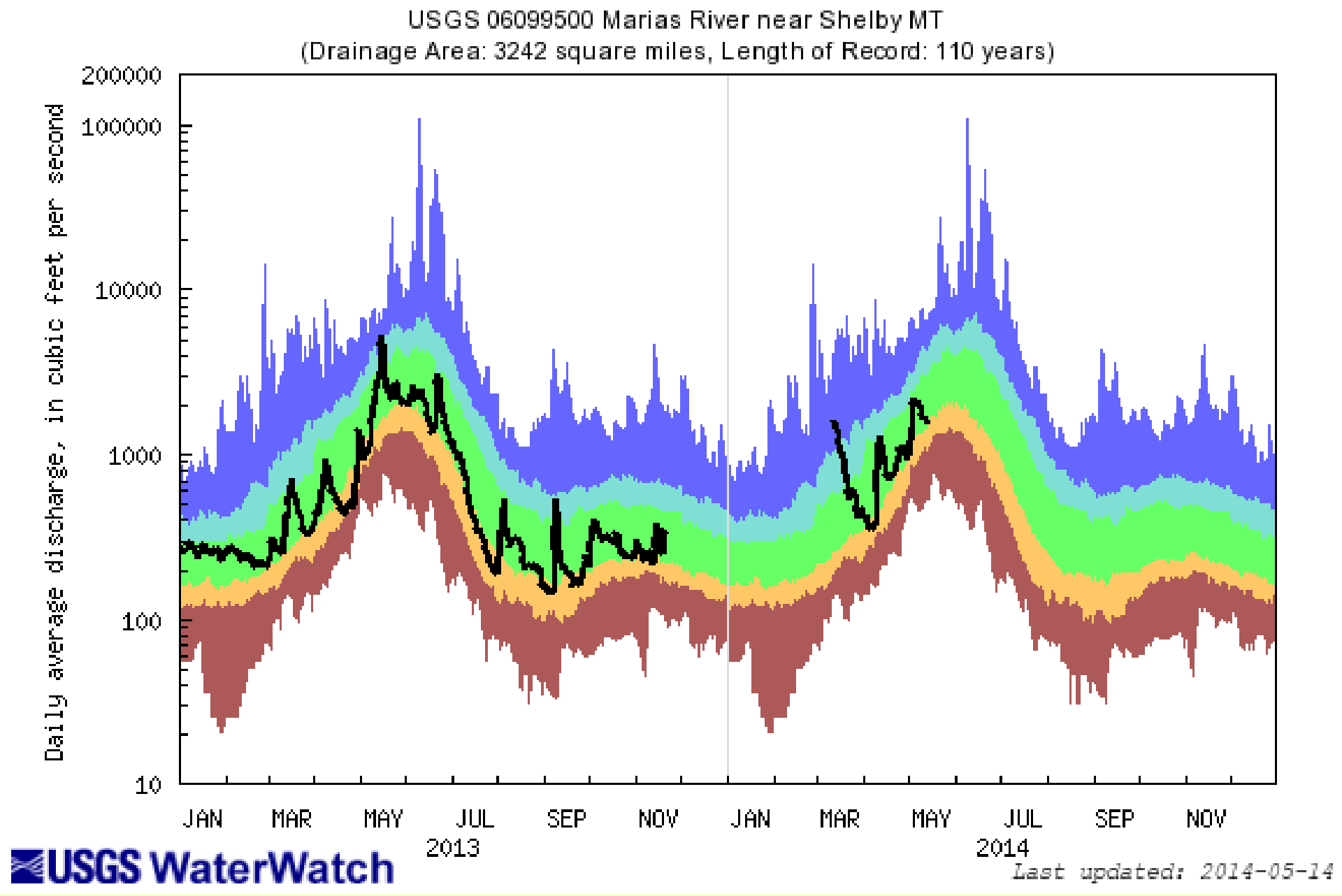
Last updated: 2014-05-14

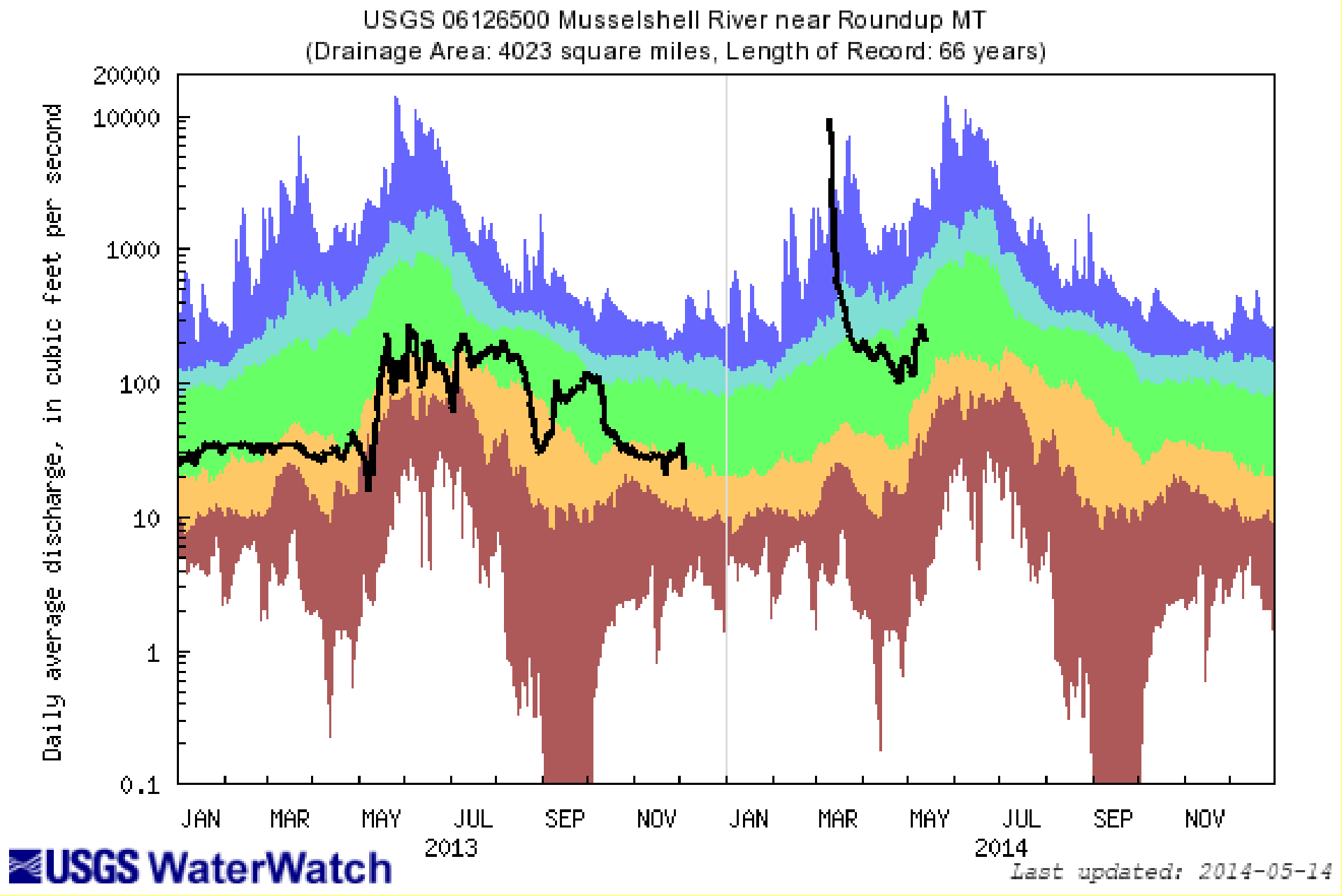

USGS 06043500 Gallatin River near Gallatin Gateway MT
(Drainage Area: 825 square miles, Length of Record: 123 years)
Daily average discharge, in cubic feet per second
9000
1000
100
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal


USGS 06043500 Gallatin River near Gallatin Gateway MT
(Drainage area: 825 square miles, Length of Record: 83 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (1934)
Highest observed cumulative flow (1976)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
40000
35000
30000
25000
20000
15000
10000
5000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14


USGS 06054500 Missouri River at Toston MT
(Drainage Area: 14669 square miles, Length of Record: 122 years)
Daily average discharge, in cubic feet per second
40000
10000
1000
JAN
MAR
MAY
JUL
SEP
NOV
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

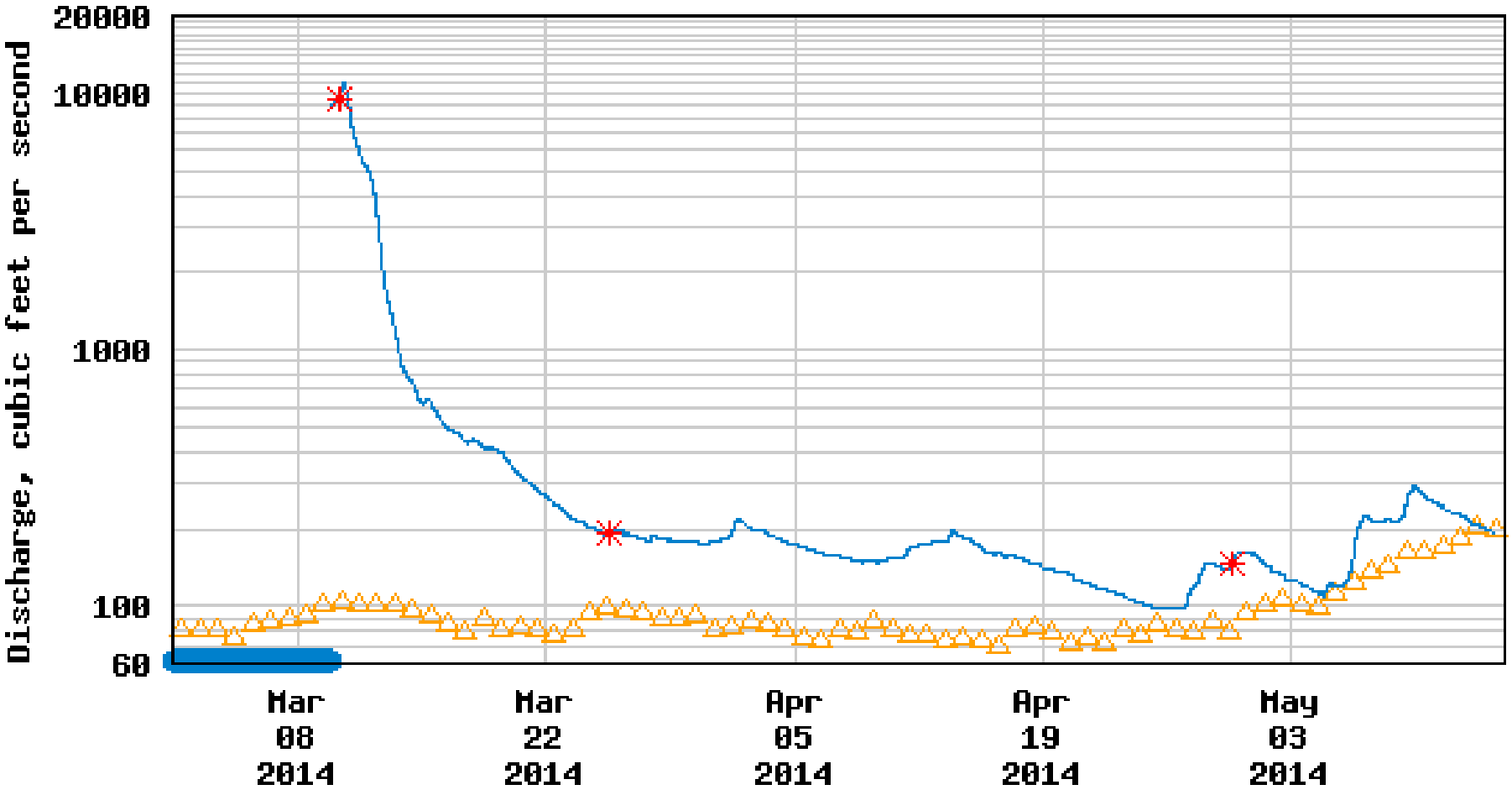

USGS 06054500 Missouri River at Toston MT
(Drainage area: 14669 square miles, Length of Record: 79 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (2004)
Highest observed cumulative flow (1997)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
250000
200000
150000
100000
50000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14

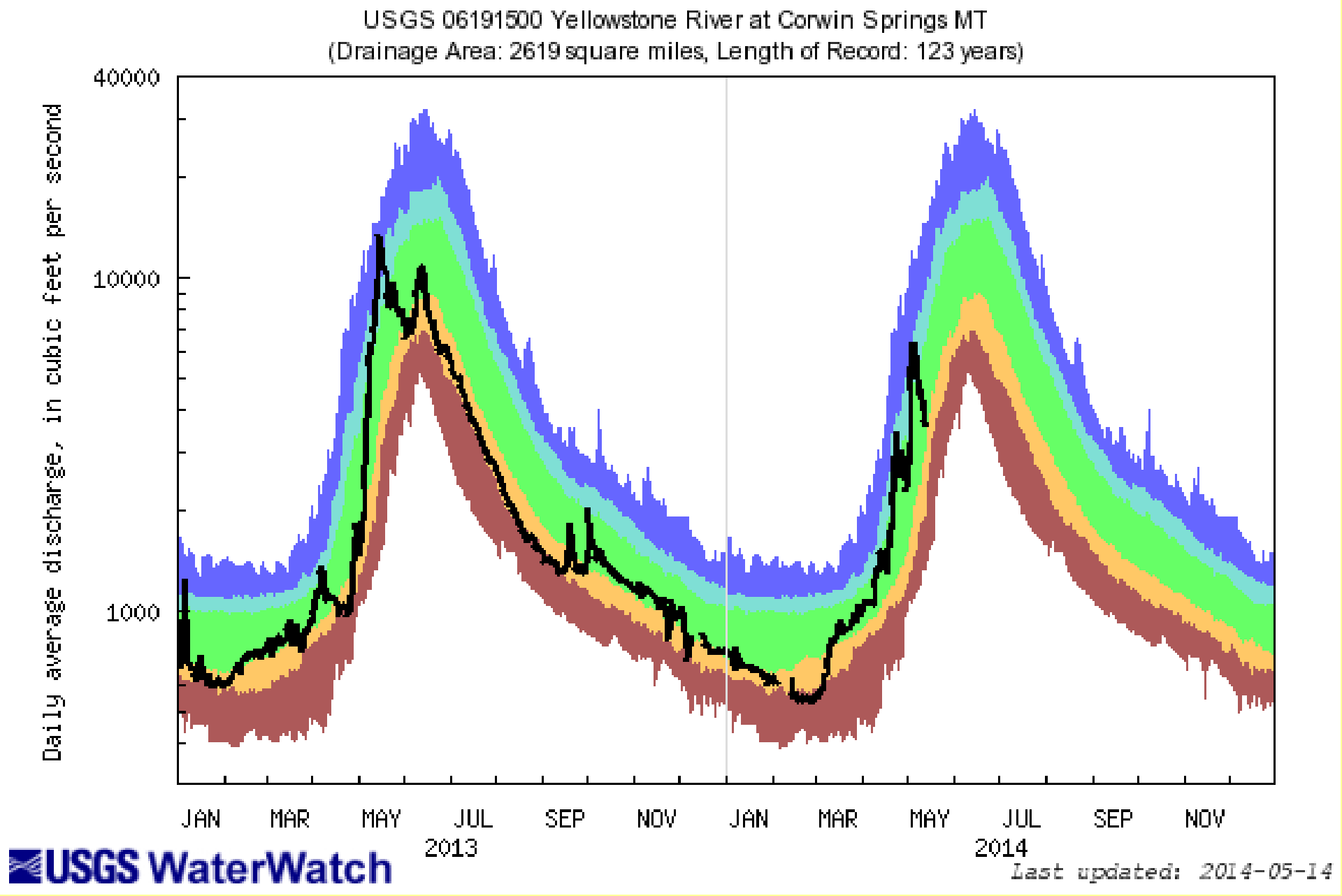

USGS 06099500 Marias River near Shelby MT
(Drainage Area: 3242 square miles, Length of Record: 110 years)
Daily average discharge, in cubic feet per second
200000
100000
10000
1000
100
10
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

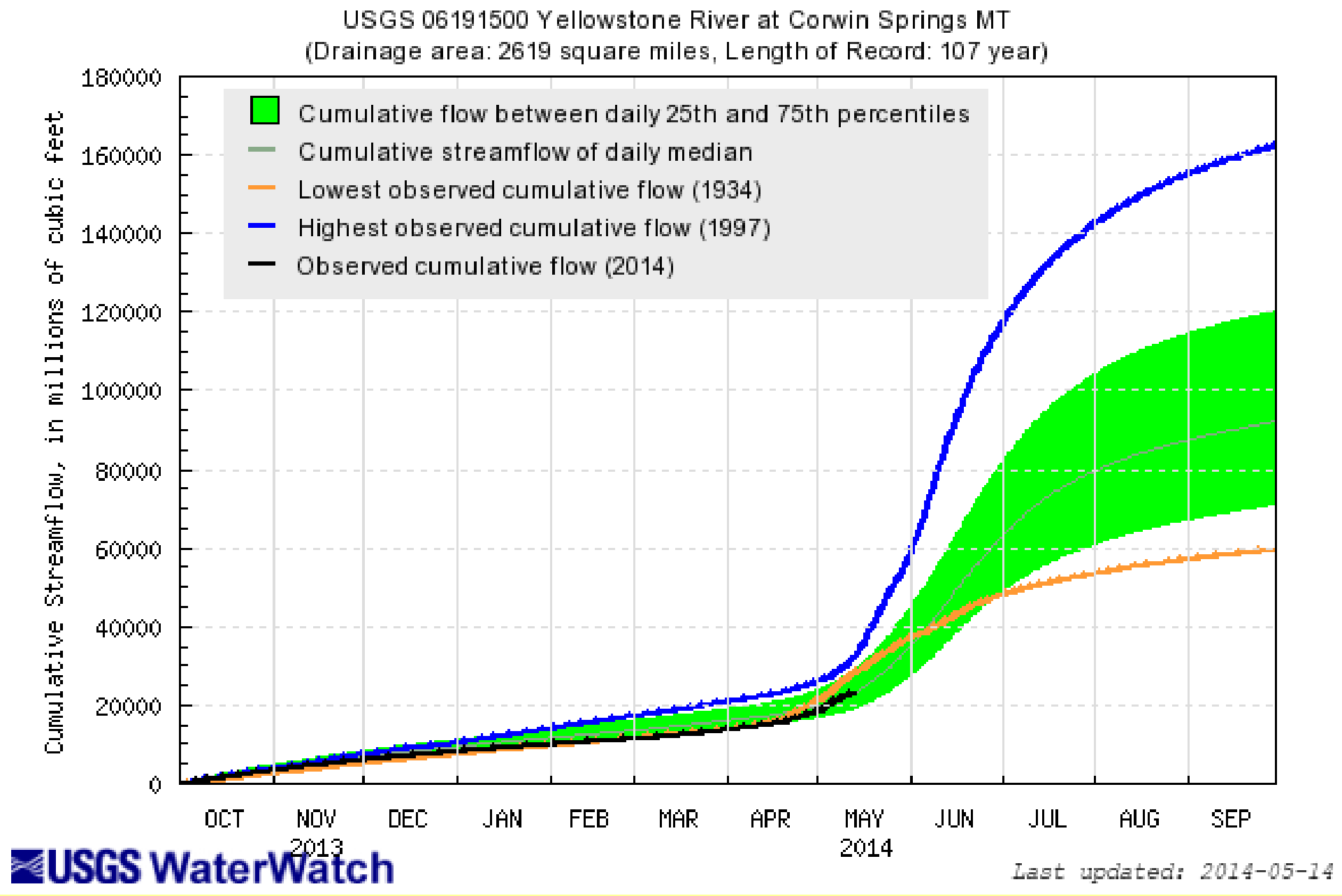

USGS 06126500 Musselshell River near Roundup MT
(Drainage Area: 4023 square miles, Length of Record: 66 years)
Daily average discharge, in cubic feet per second
20000
10000
1000
100
10
1
0.1
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

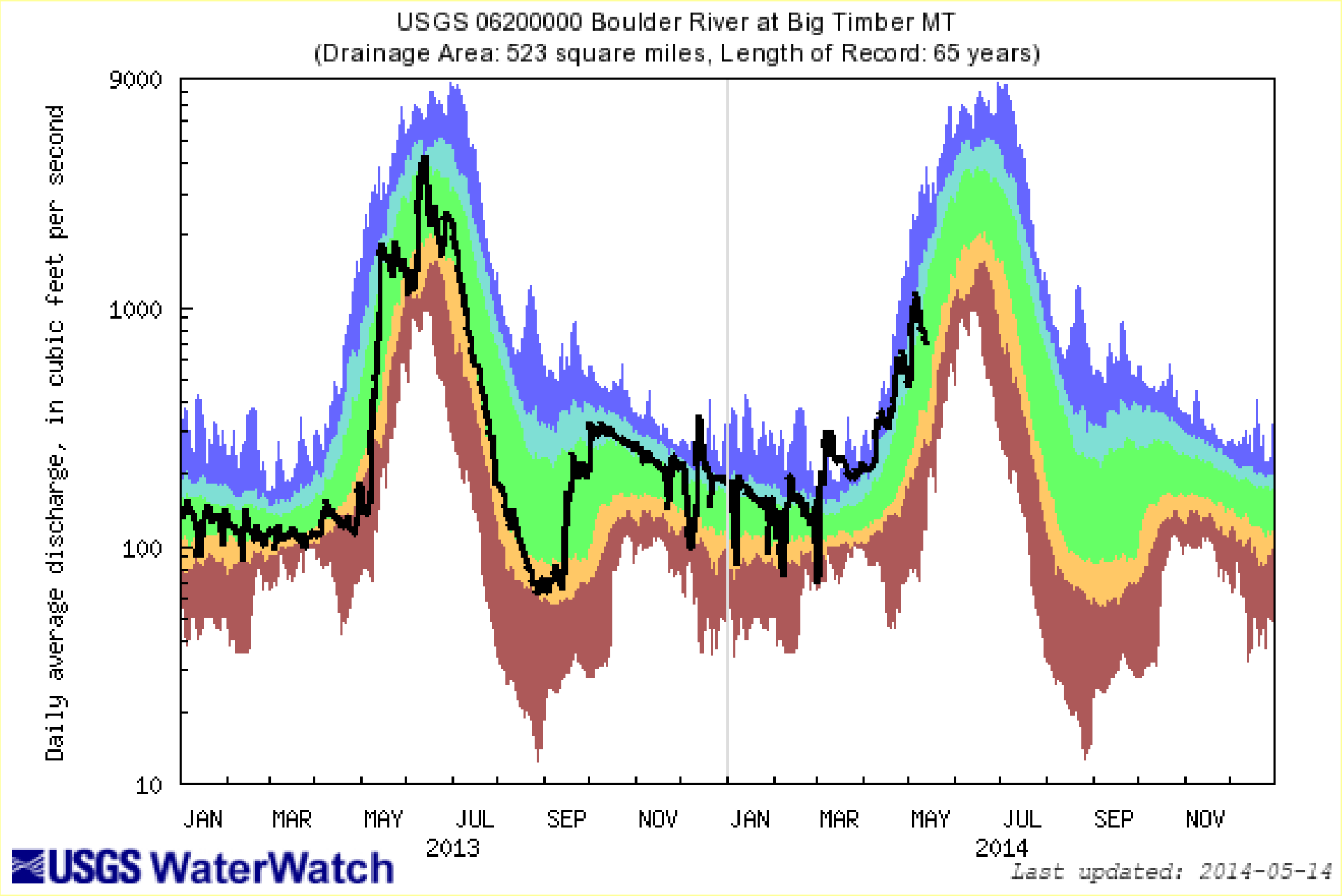
USGS

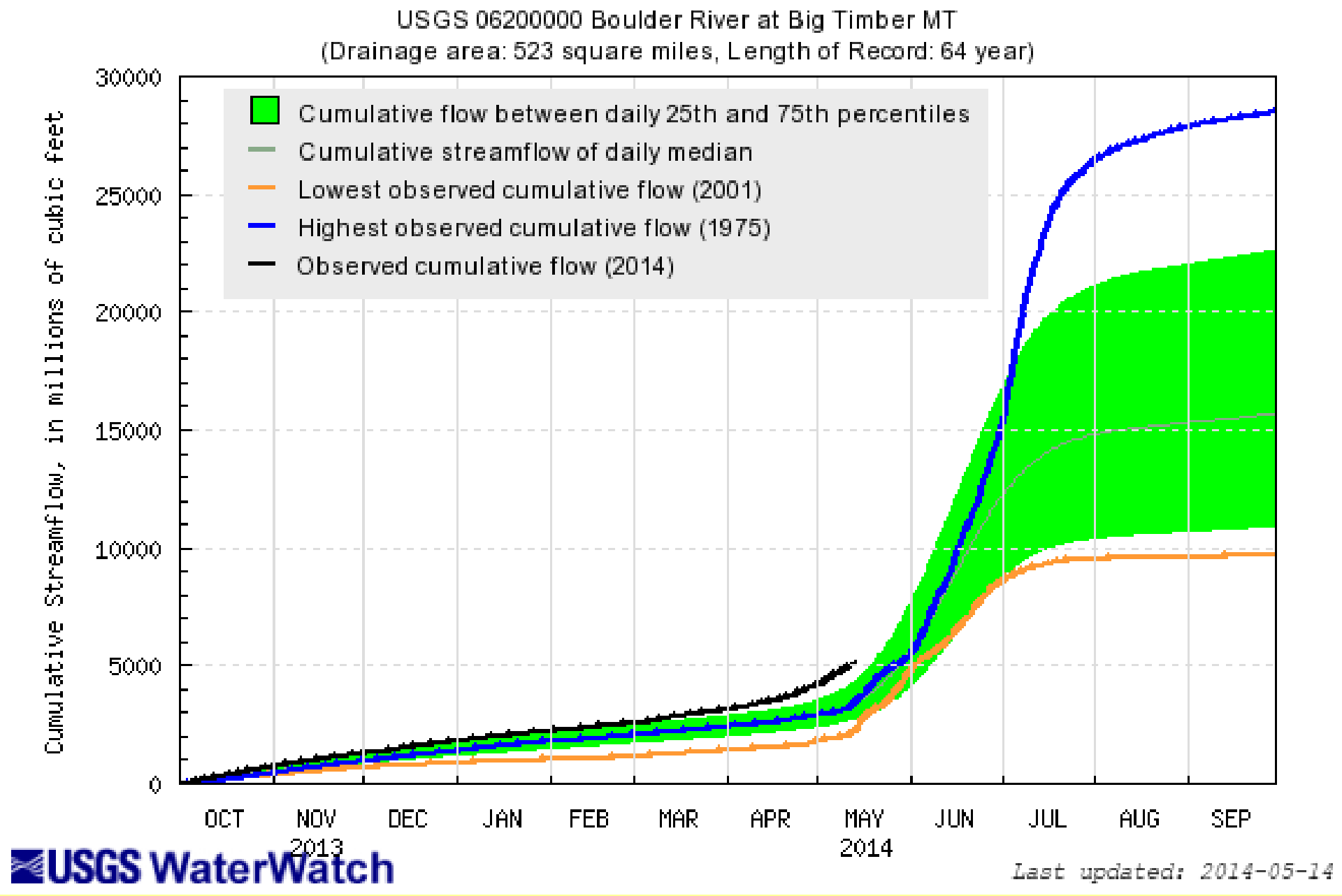
USGS 06126500 Musselshell River near Roundup MT




USGS 06191500 Yellowstone River at Corwin Springs MT
(Drainage Area: 2619 square miles, Length of Record: 123 years)
Daily average discharge, in cubic feet per second
40000
10000
1000
JAN
MAR
MAY
JUL
SEP
NOV
2013
JAN
MAR
MAY
JUL
SEP
NOV
2014
USGS WaterWatch
Last updated: 2014-05-14

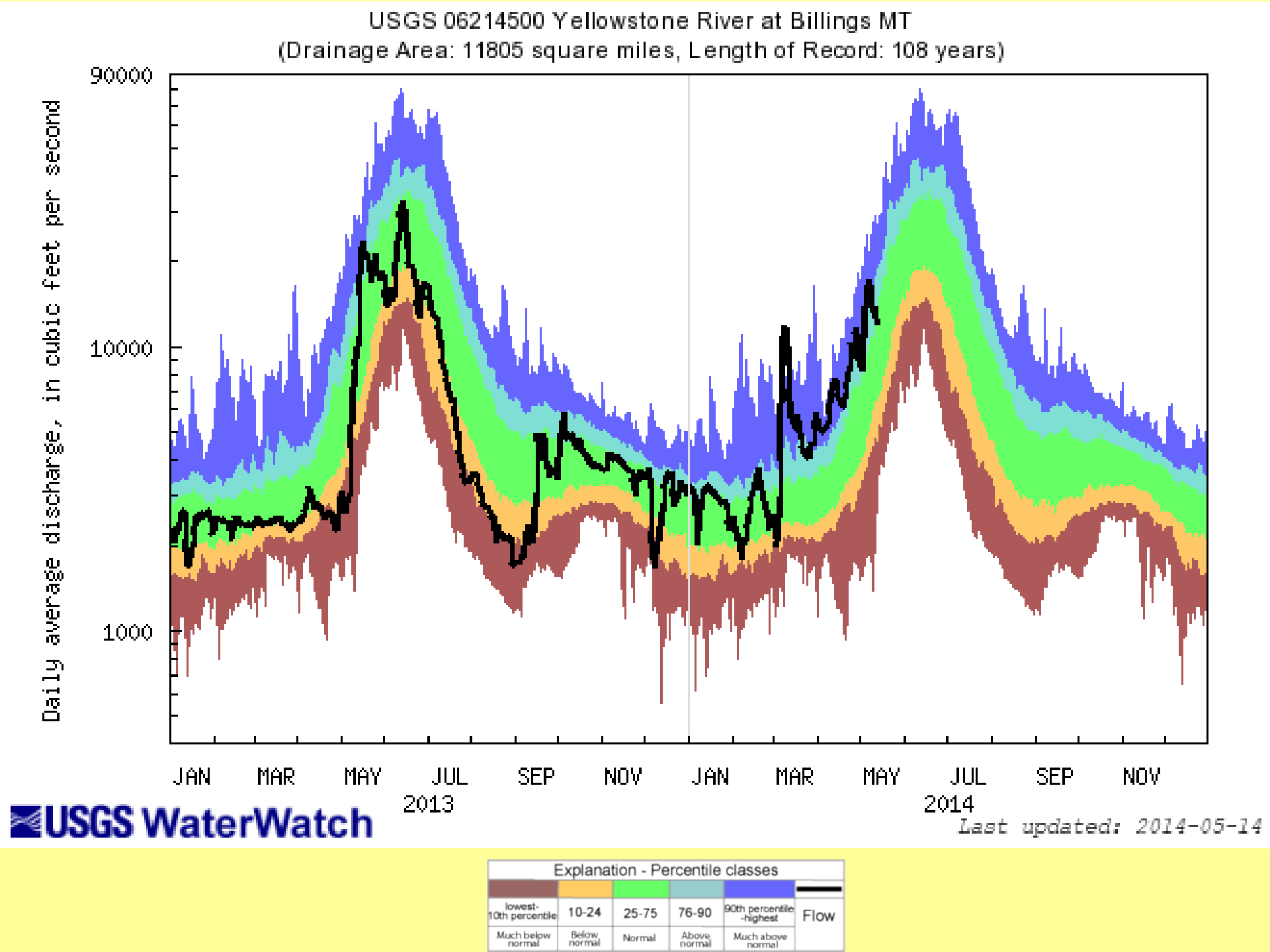

USGS 06191500 Yellowstone River at Corwin Springs MT
(Drainage area: 2619 square miles, Length of Record: 107 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (1934)
Highest observed cumulative flow (1997)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14

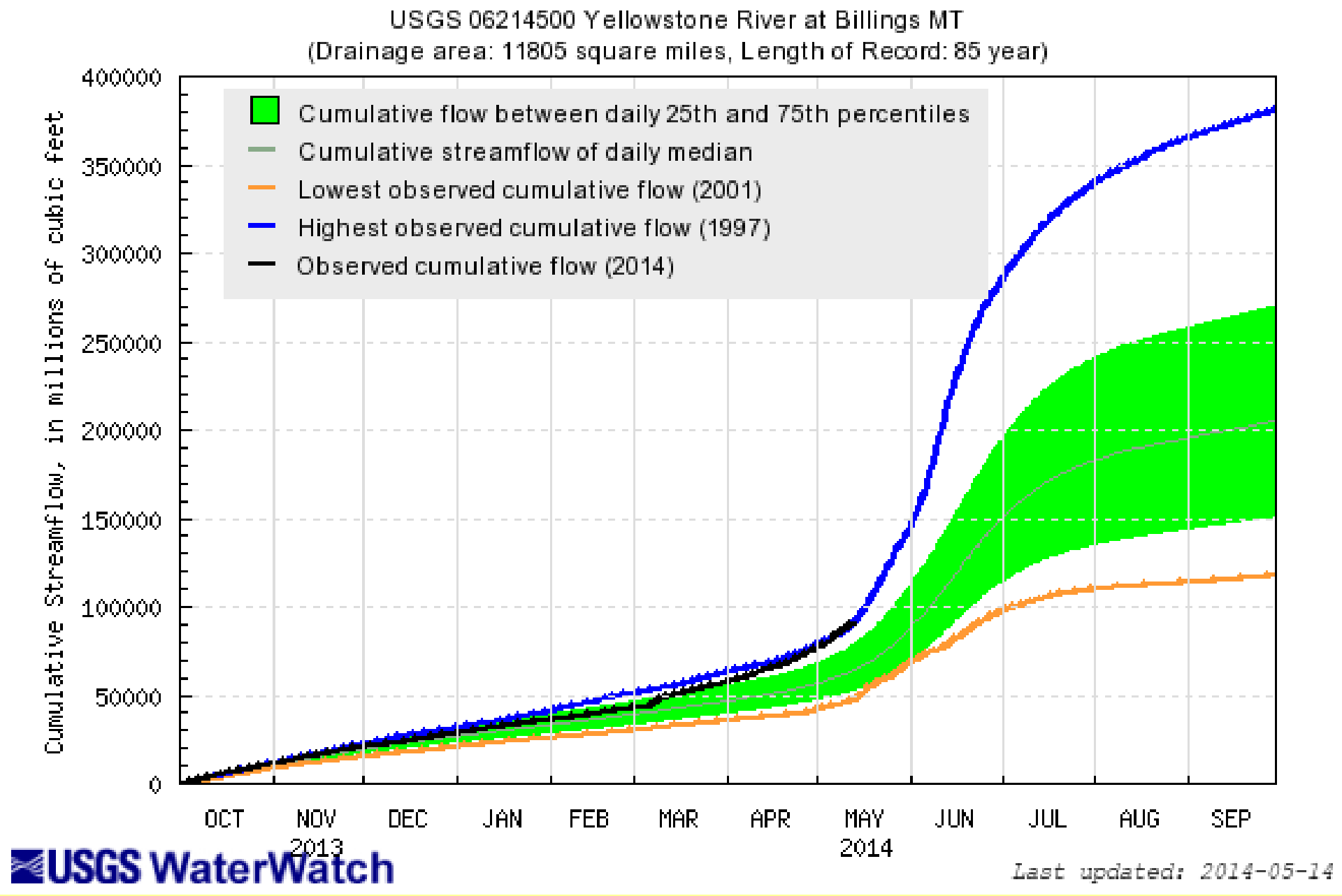

USGS 06200000 Boulder River at Big Timber MT
(Drainage Area: 523 square miles, Length of Record: 65 years)
Daily average discharge, in cubic feet per second
9000
1000
100
10
JAN
MAR
MAY
JUL
SEP
NOV
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

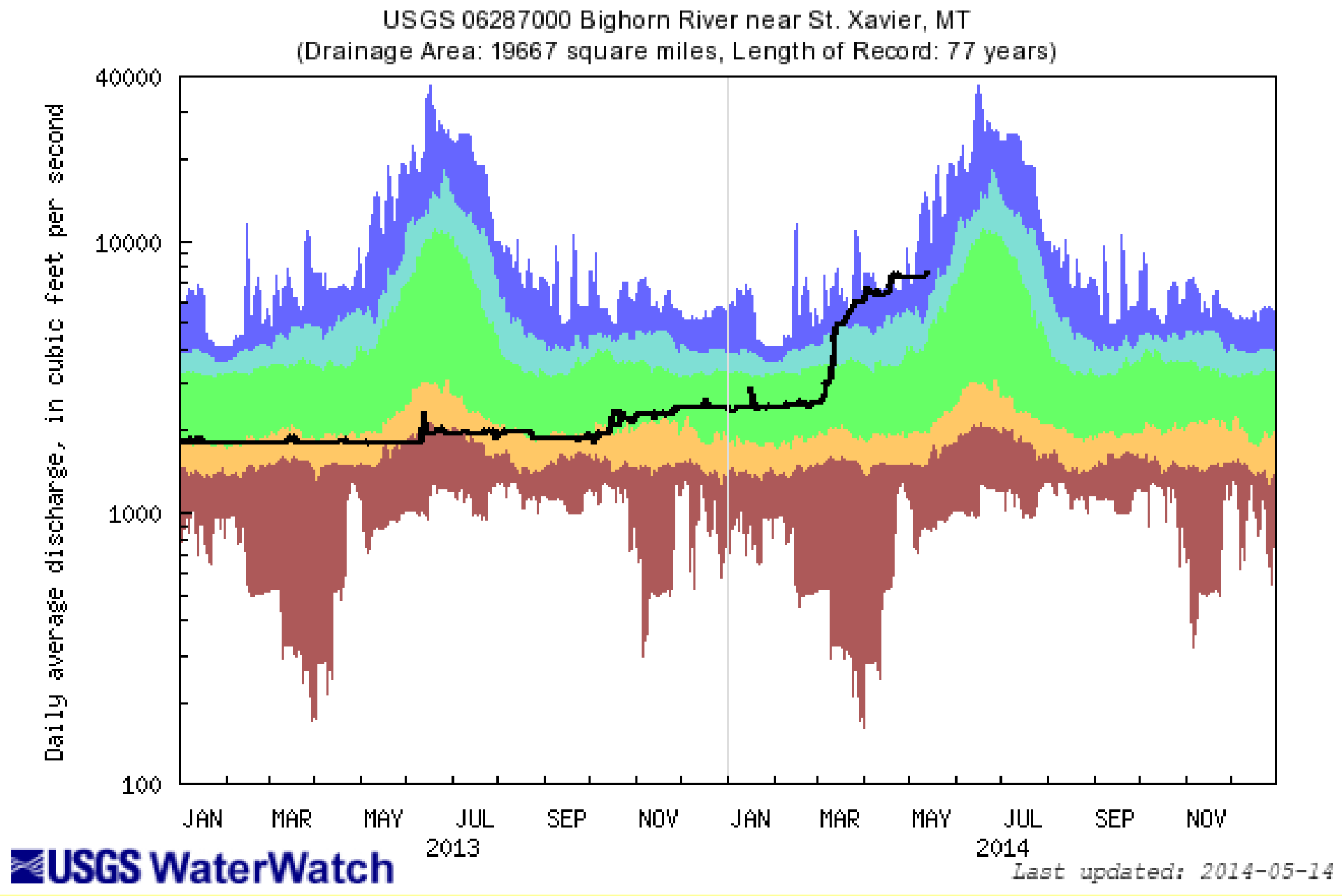


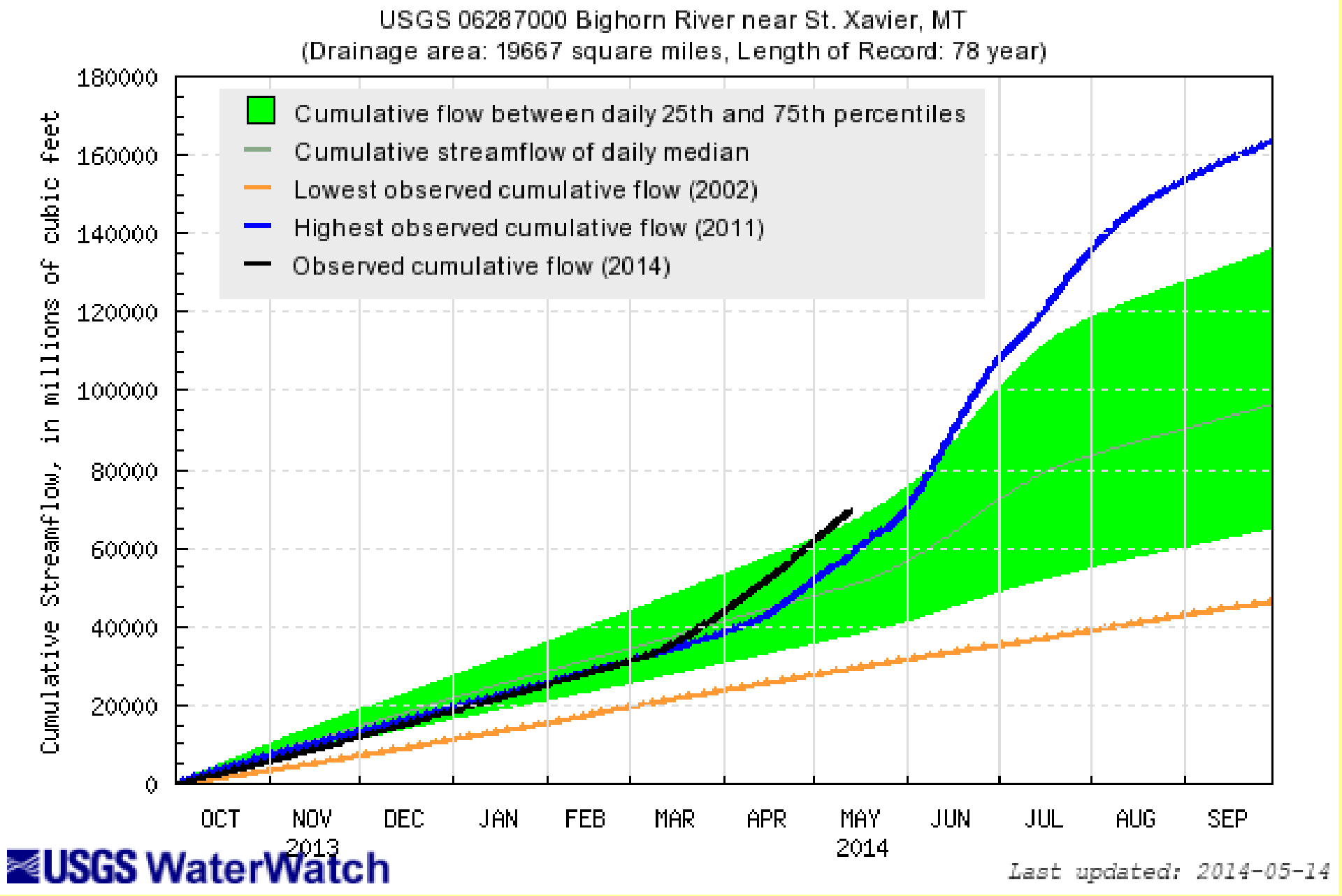
USGS WaterWatch

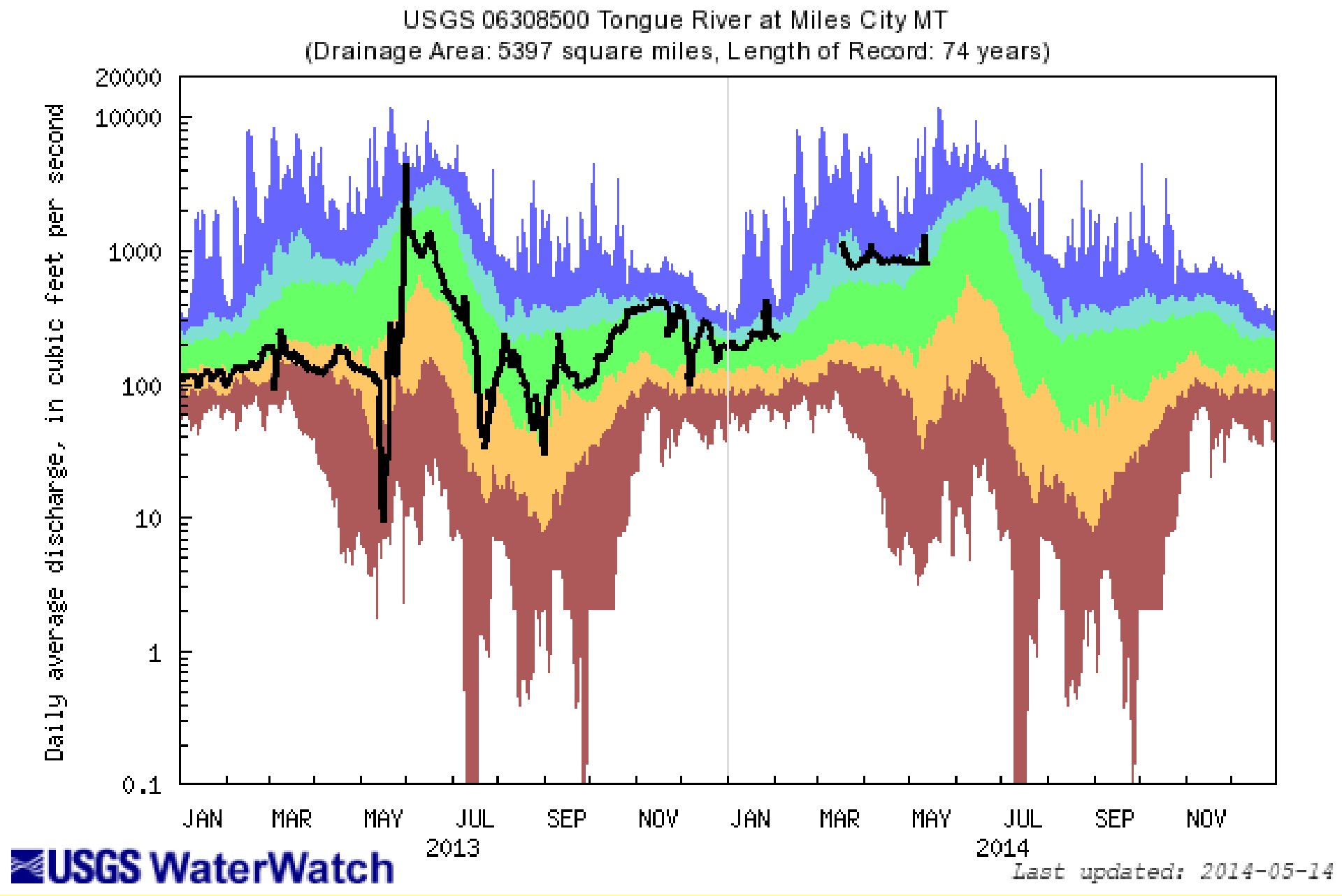
Last updated: 2014-05-14

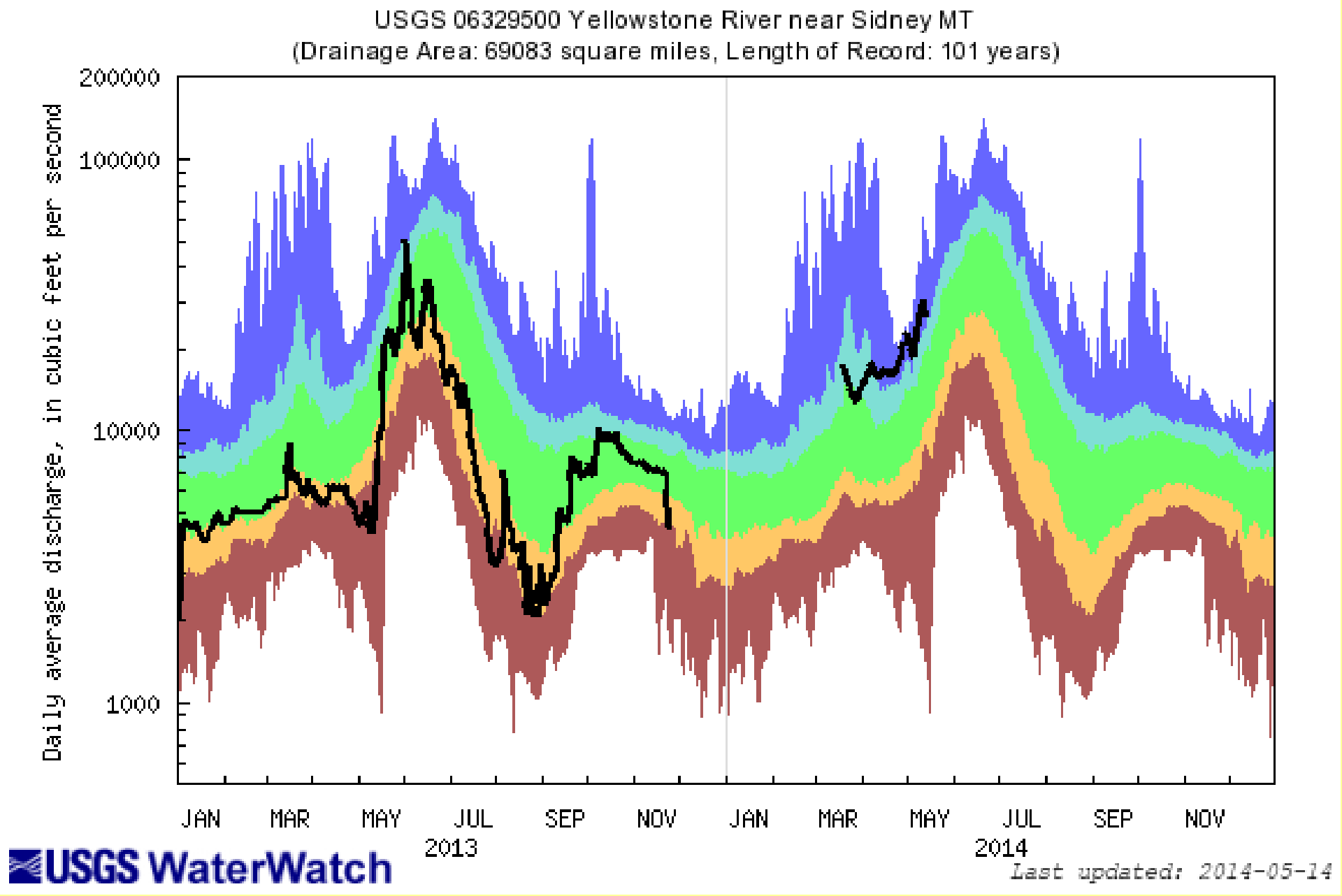

USGS 06214500 Yellowstone River at Billings MT
(Drainage Area: 11805 square miles, Length of Record: 108 years)
Daily average discharge, in cubic feet per second
90000
10000
1000
JAN
MAR
MAY
JUL
SEP
NOV
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

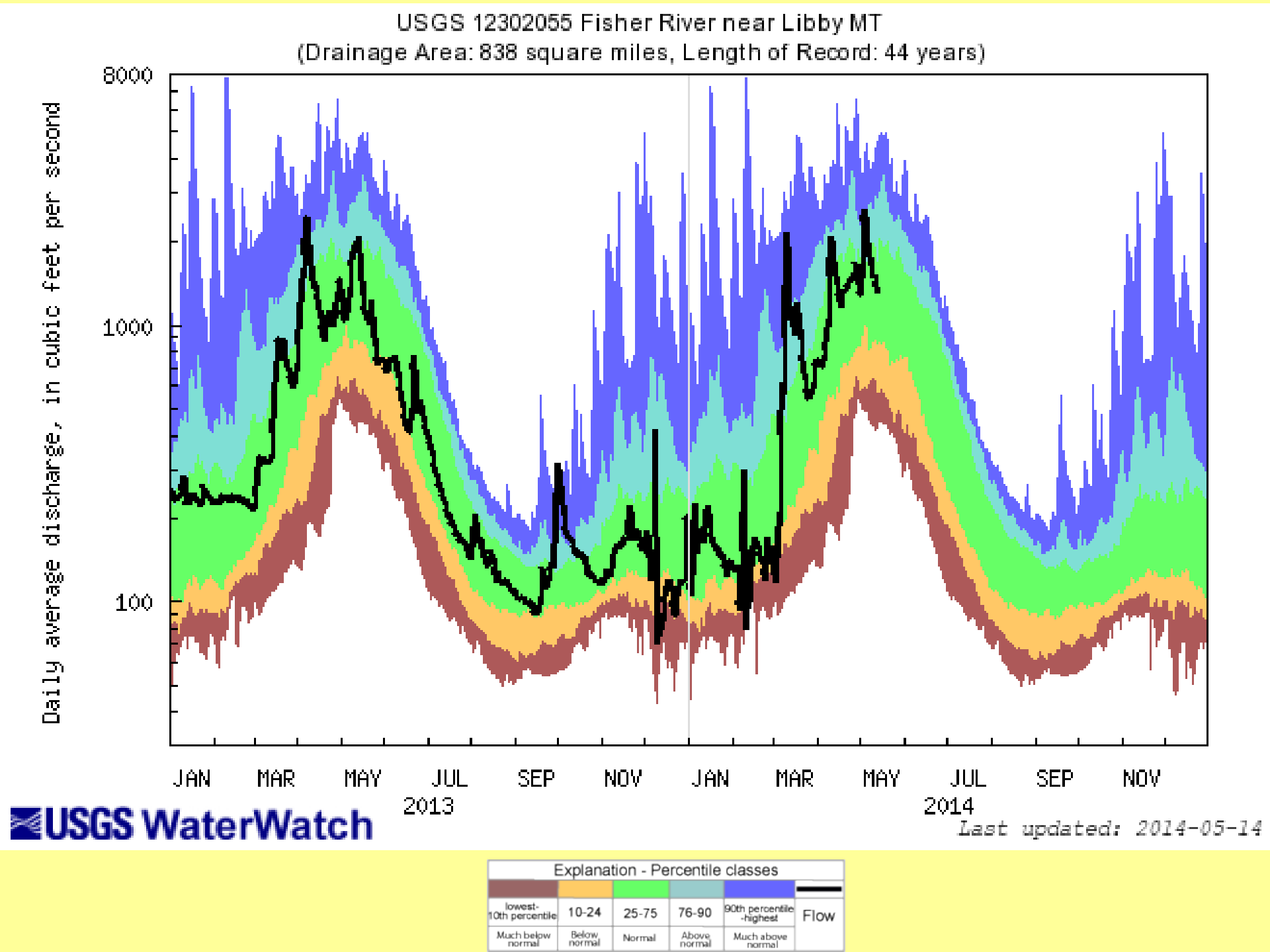

USGS 06214500 Yellowstone River at Billings MT
(Drainage area: 11805 square miles, Length of Record: 85 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (2001)
Highest observed cumulative flow (1997)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
400000
350000
300000
250000
200000
150000
100000
50000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14

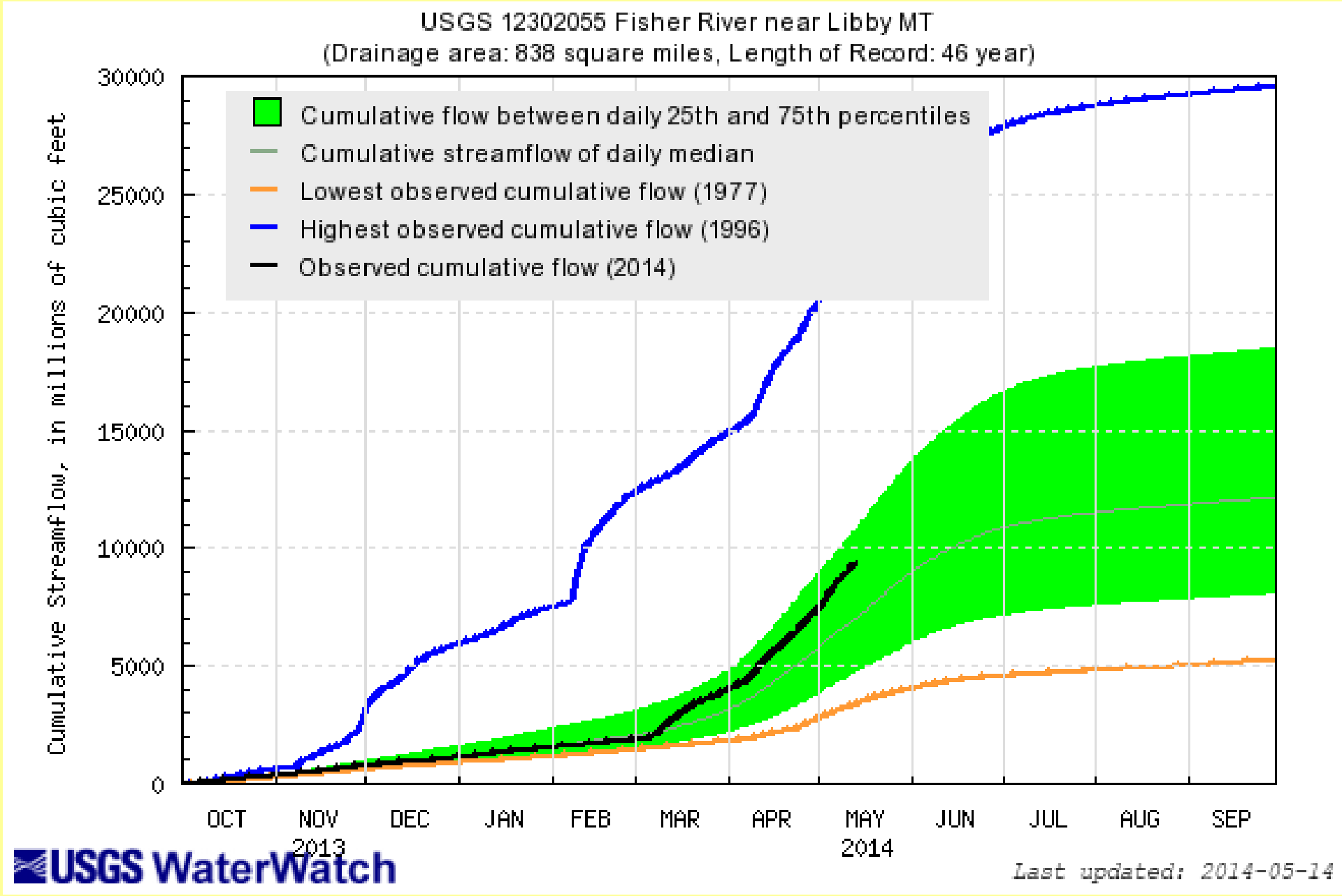

USGS 06287000 Bighorn River near St. Xavier, MT
(Drainage Area: 19667 square miles, Length of Record: 77 years)
Daily average discharge, in cubic feet per second
40000
10000
1000
100
JAN
MAR
MAY
JUL
SEP
NOV
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

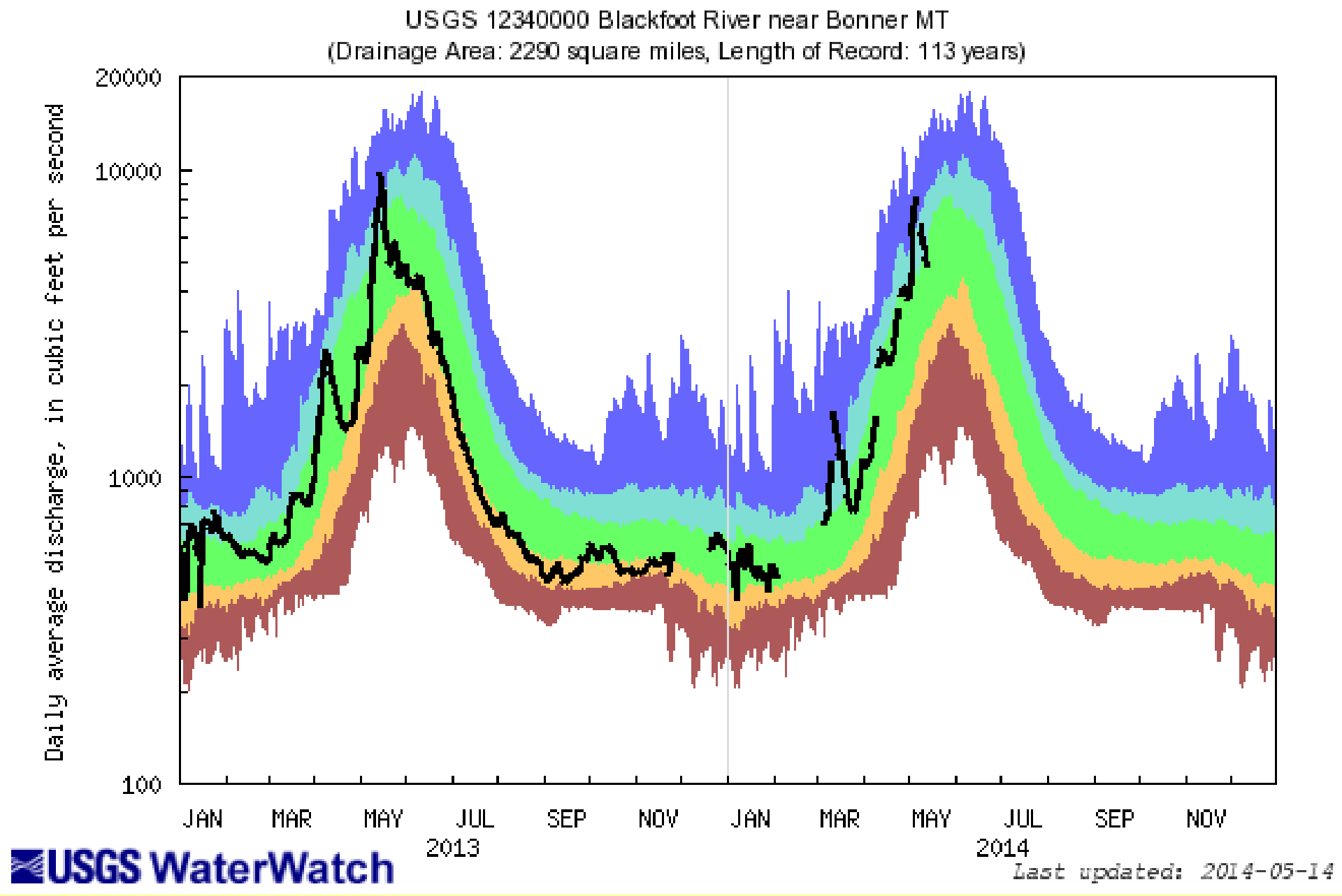

USGS 06287000 Bighorn River near St. Xavier, MT
(Drainage area: 19667 square miles, Length of Record: 78 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (2002)
Highest observed cumulative flow (2011)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14

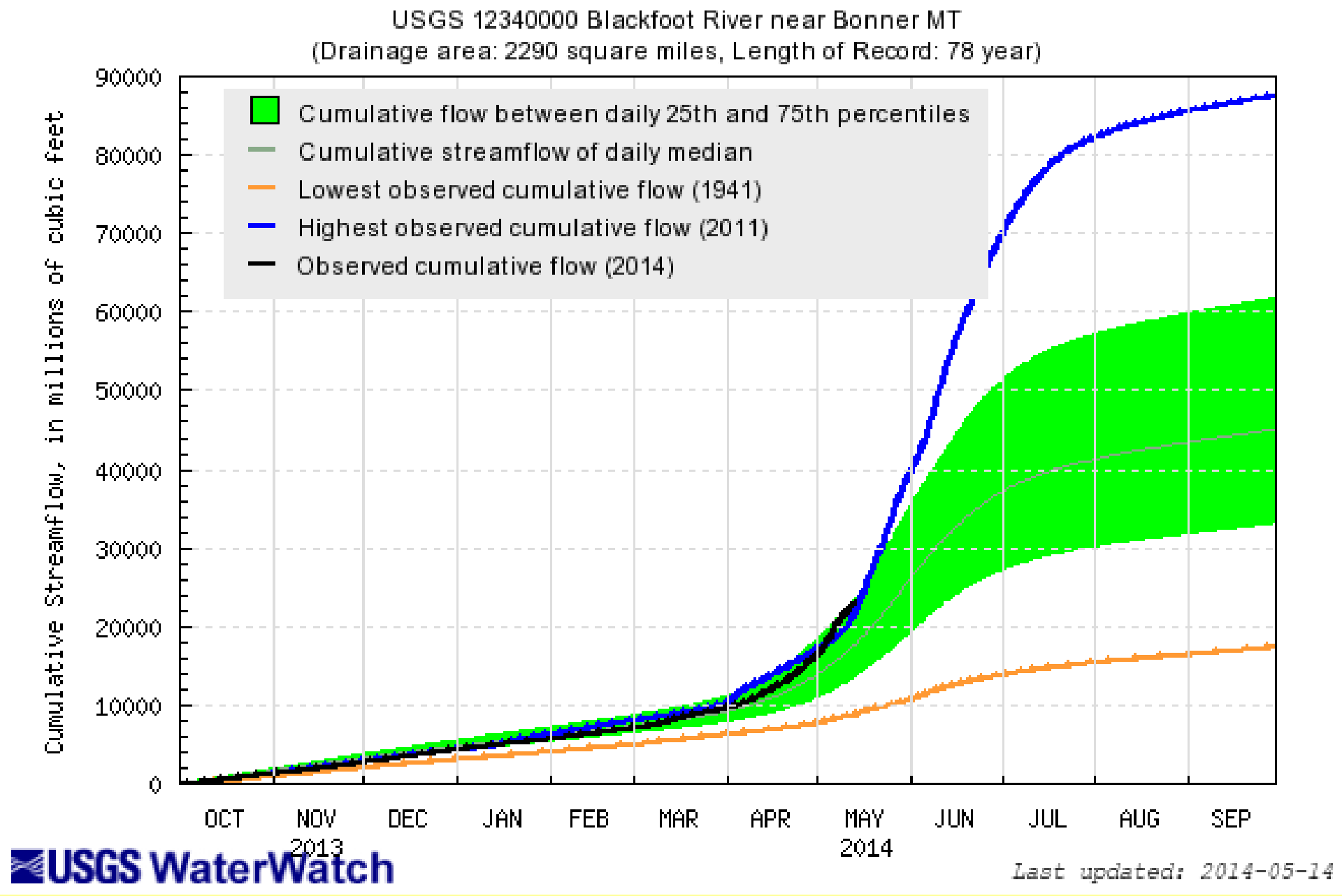

USGS 06308500 Tongue River at Miles City MT
(Drainage Area: 5397 square miles, Length of Record: 74 years)
Daily average discharge, in cubic feet per second
20000
10000
1000
100
10
1
0.1
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

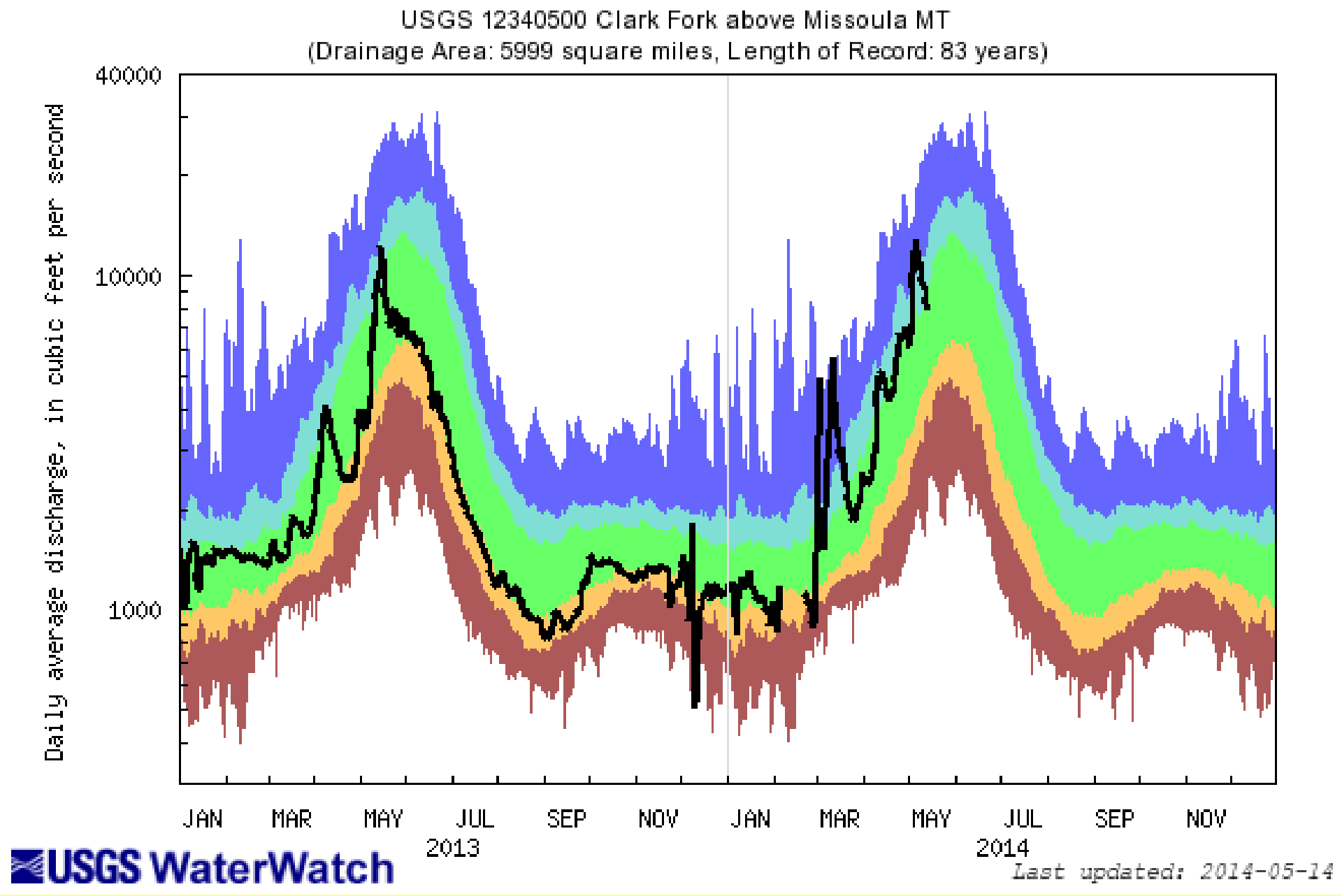

USGS 06329500 Yellowstone River near Sidney MT
(Drainage Area: 69083 square miles, Length of Record: 101 years)
Daily average discharge, in cubic feet per second
200000
100000
10000
1000
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

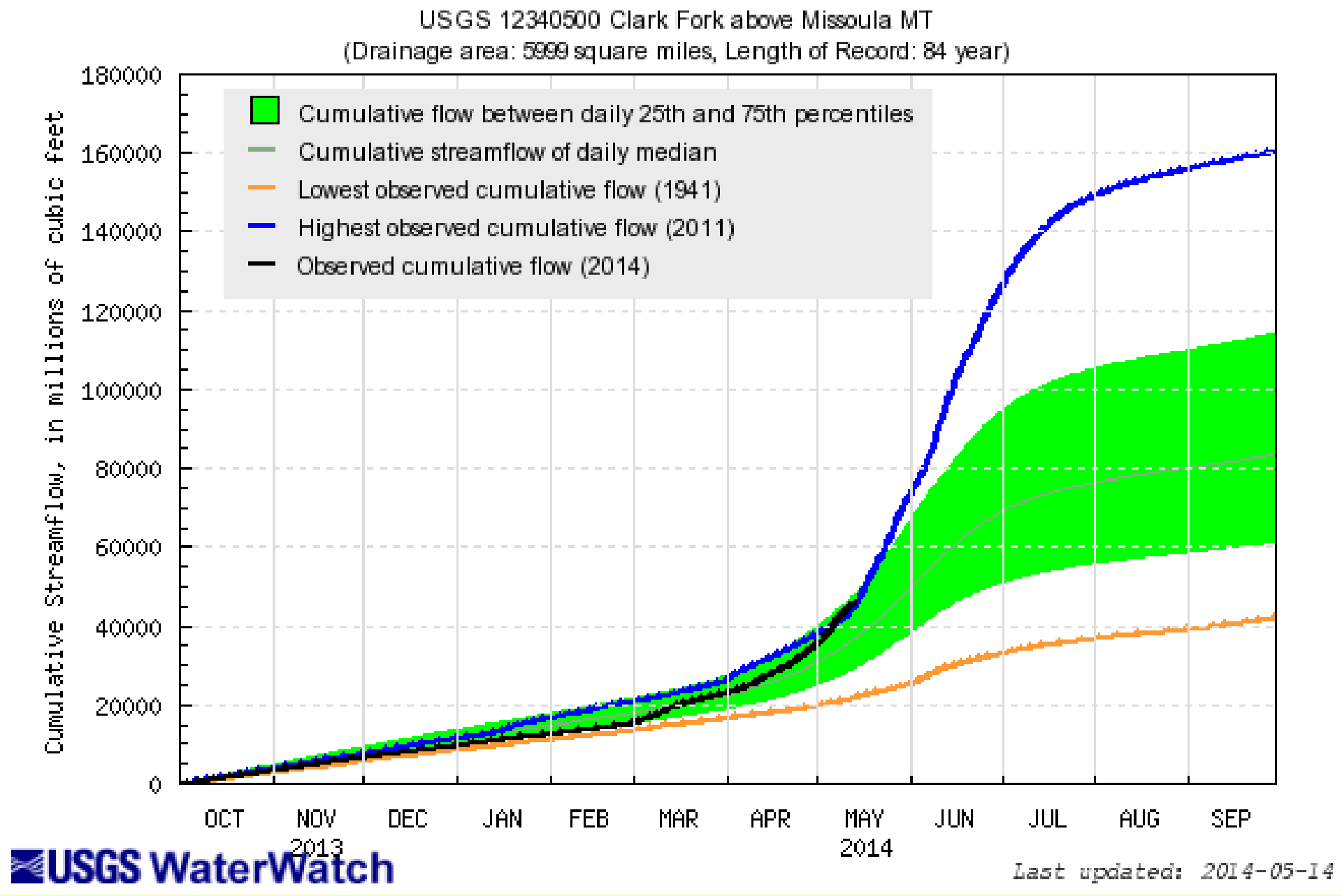

USGS 12302055 Fisher River near Libby MT
(Drainage Area: 838 square miles, Length of Record: 44 years)
Daily average discharge, in cubic feet per second
8000
1000
100
JAN
MAR
MAY
JUL
SEP
NOV
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile-highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal


USGS 12302055 Fisher River near Libby MT
(Drainage area: 838 square miles, Length of Record: 46 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (1977)
Highest observed cumulative flow (1996)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
30000
25000
20000
15000
10000
5000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14


USGS 12340000 Blackfoot River near Bonner MT
(Drainage Area: 2290 square miles, Length of Record: 113 years)
Daily average discharge, in cubic feet per second
20000
10000
1000
100
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

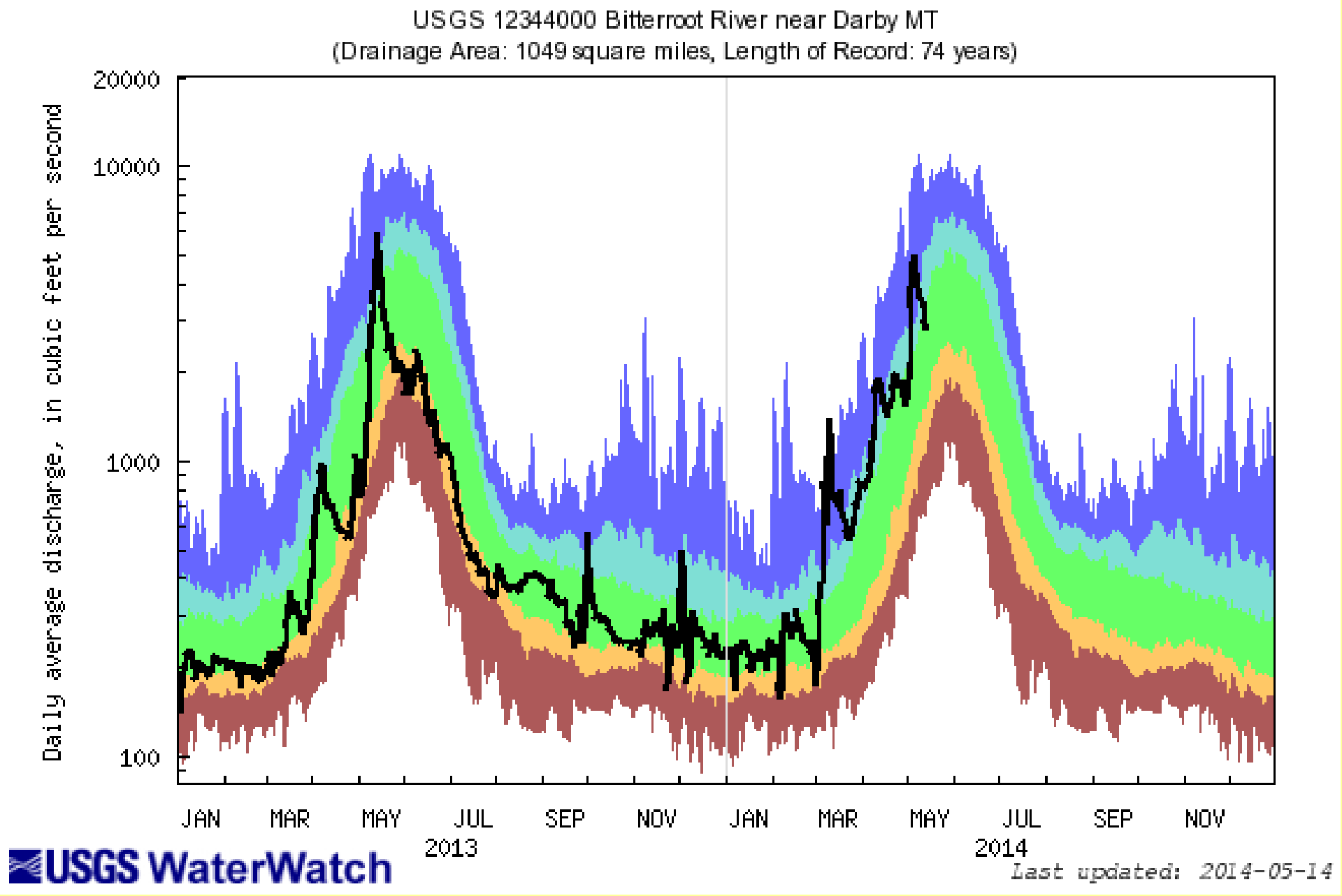

USGS 12340000 Blackfoot River near Bonner MT
(Drainage area: 2290 square miles, Length of Record: 78 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (1941)
Highest observed cumulative flow (2011)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14

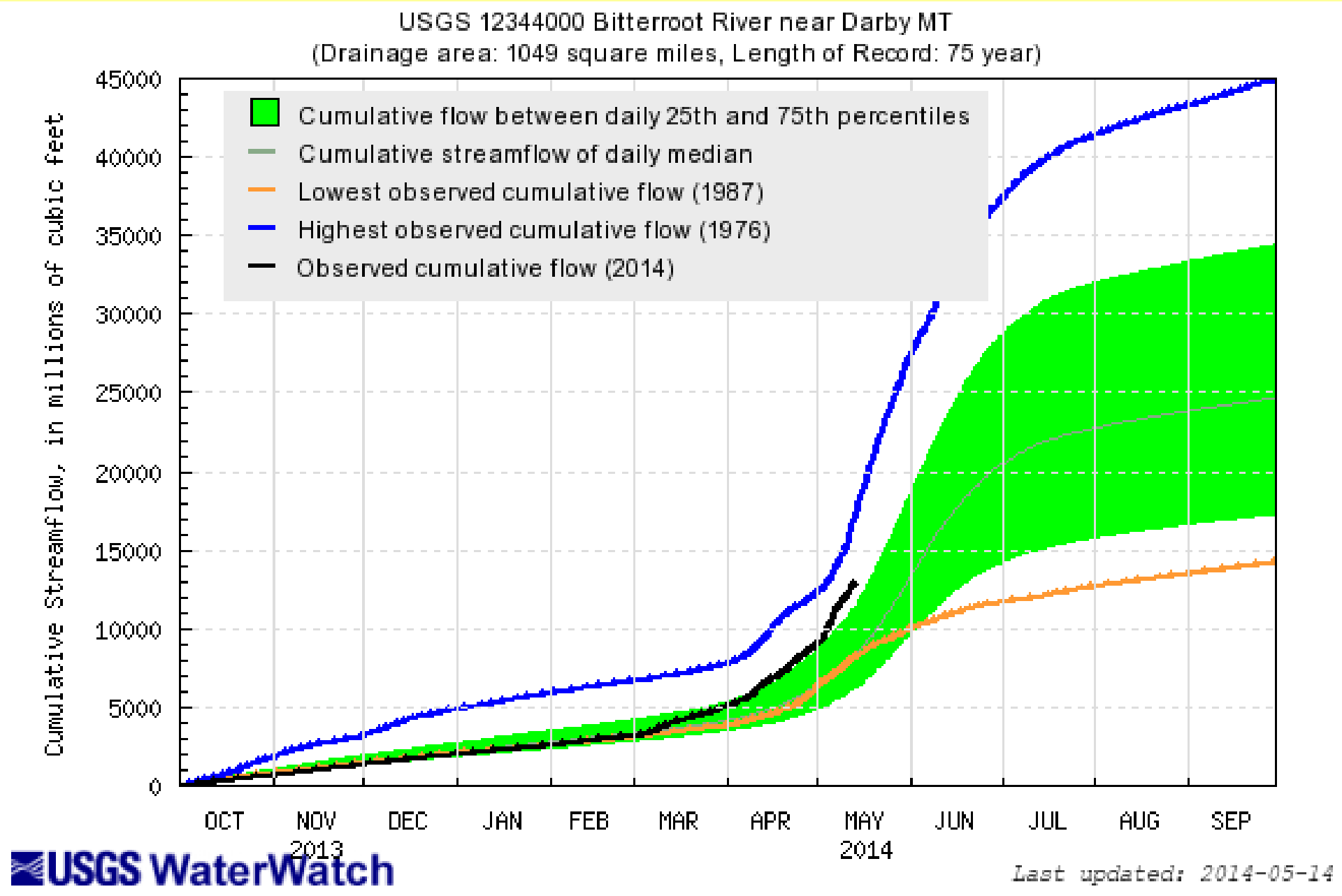

USGS 12340500 Clark Fork above Missoula MT
(Drainage Area: 5999 square miles, Length of Record: 83 years)
Daily average discharge, in cubic feet per second
40000
10000
1000
JAN
MAR
MAY
JUL
SEP
NOV
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal

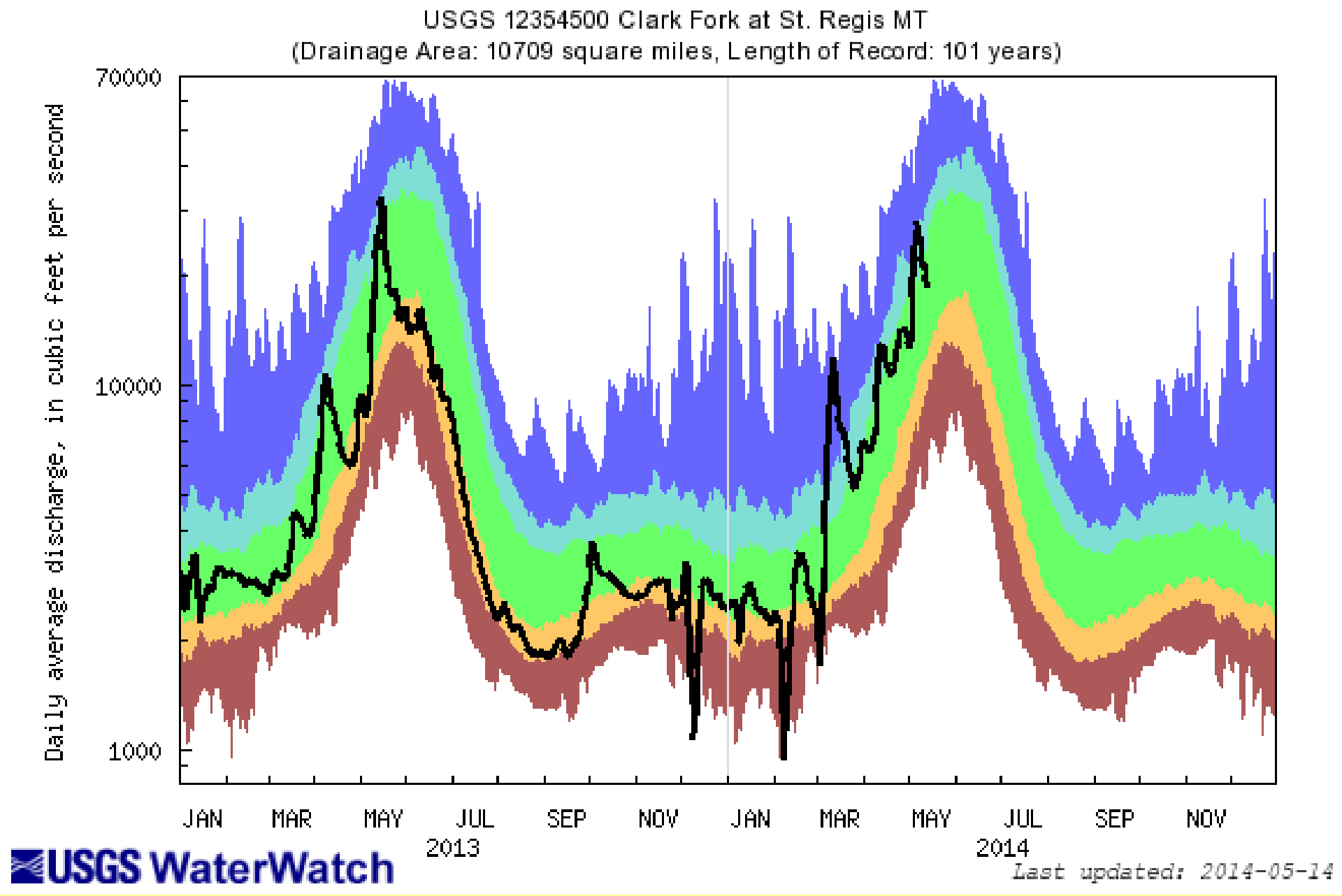


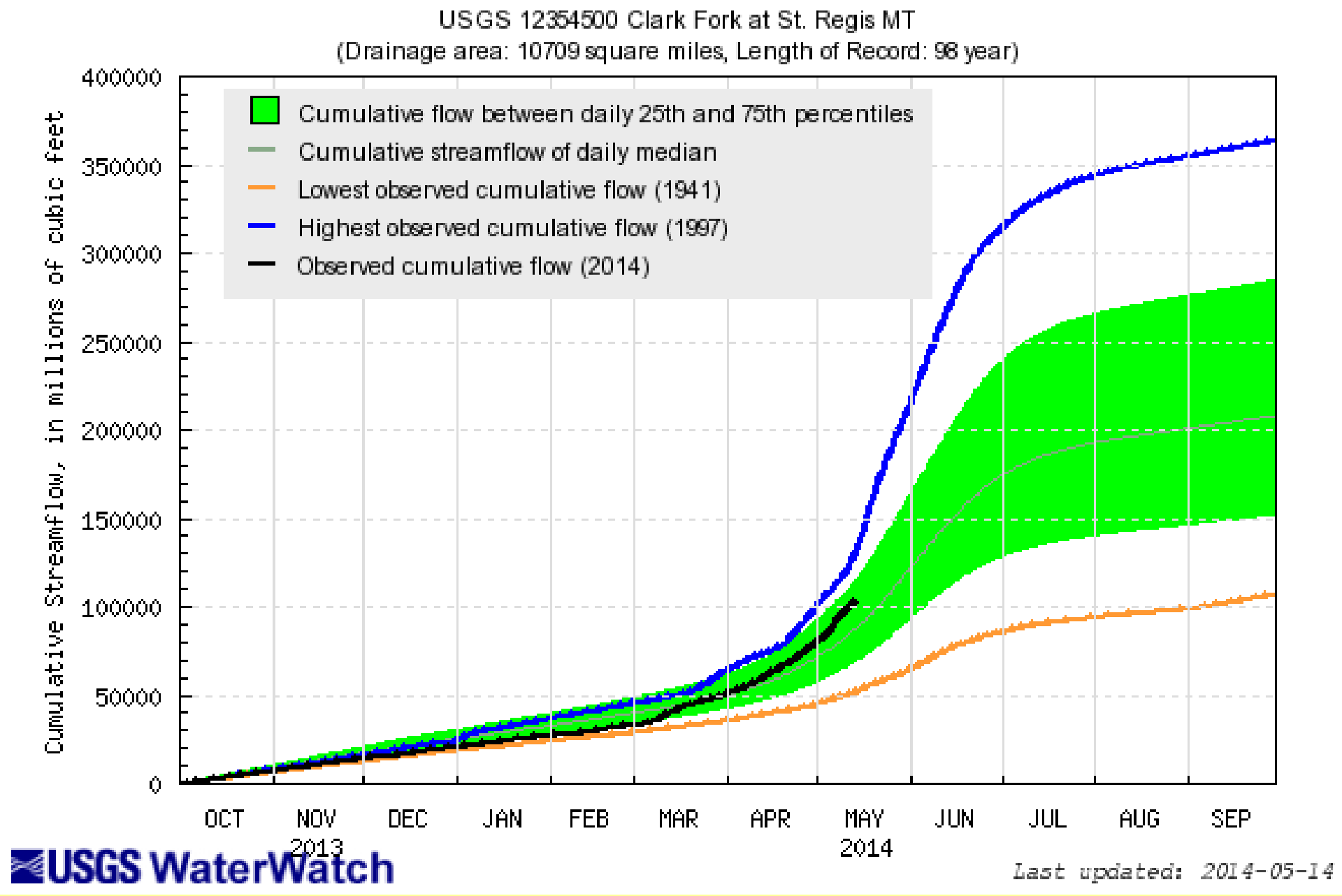
USGS WaterWatch

Last updated: 2014-05-14


USGS 12344000 Bitterroot River near Darby MT
(Drainage Area: 1049 square miles, Length of Record: 74 years)
Daily average discharge, in cubic feet per second
20000
10000
1000
100
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal


USGS 12344000 Bitterroot River near Darby MT
(Drainage area: 1049 square miles, Length of Record: 75 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (1987)
Highest observed cumulative flow (1976)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14


USGS 12354500 Clark Fork at St. Regis MT
(Drainage Area: 10709 square miles, Length of Record: 101 years)
Daily average discharge, in cubic feet per second
70000
10000
1000
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal



USGS WaterWatch

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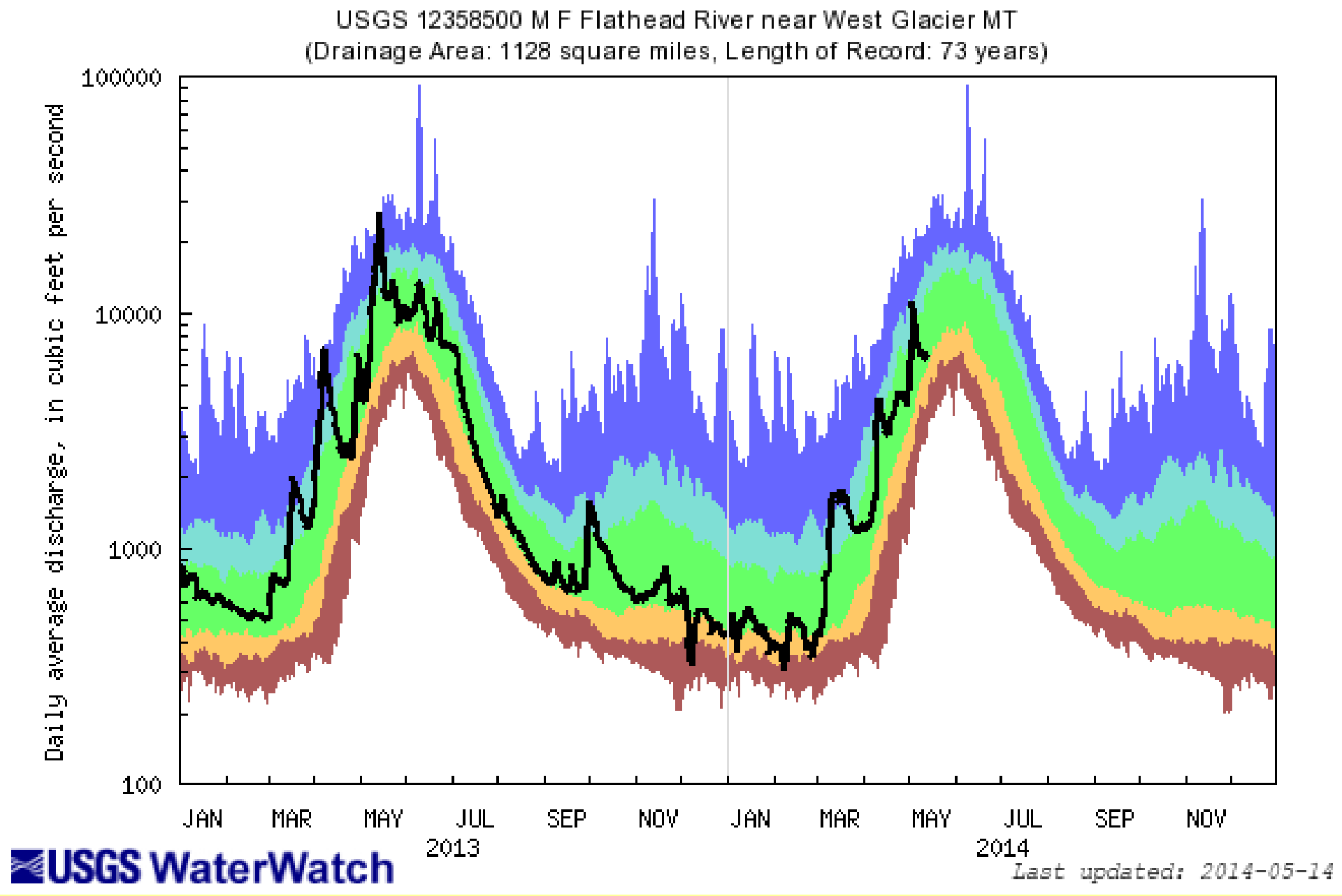
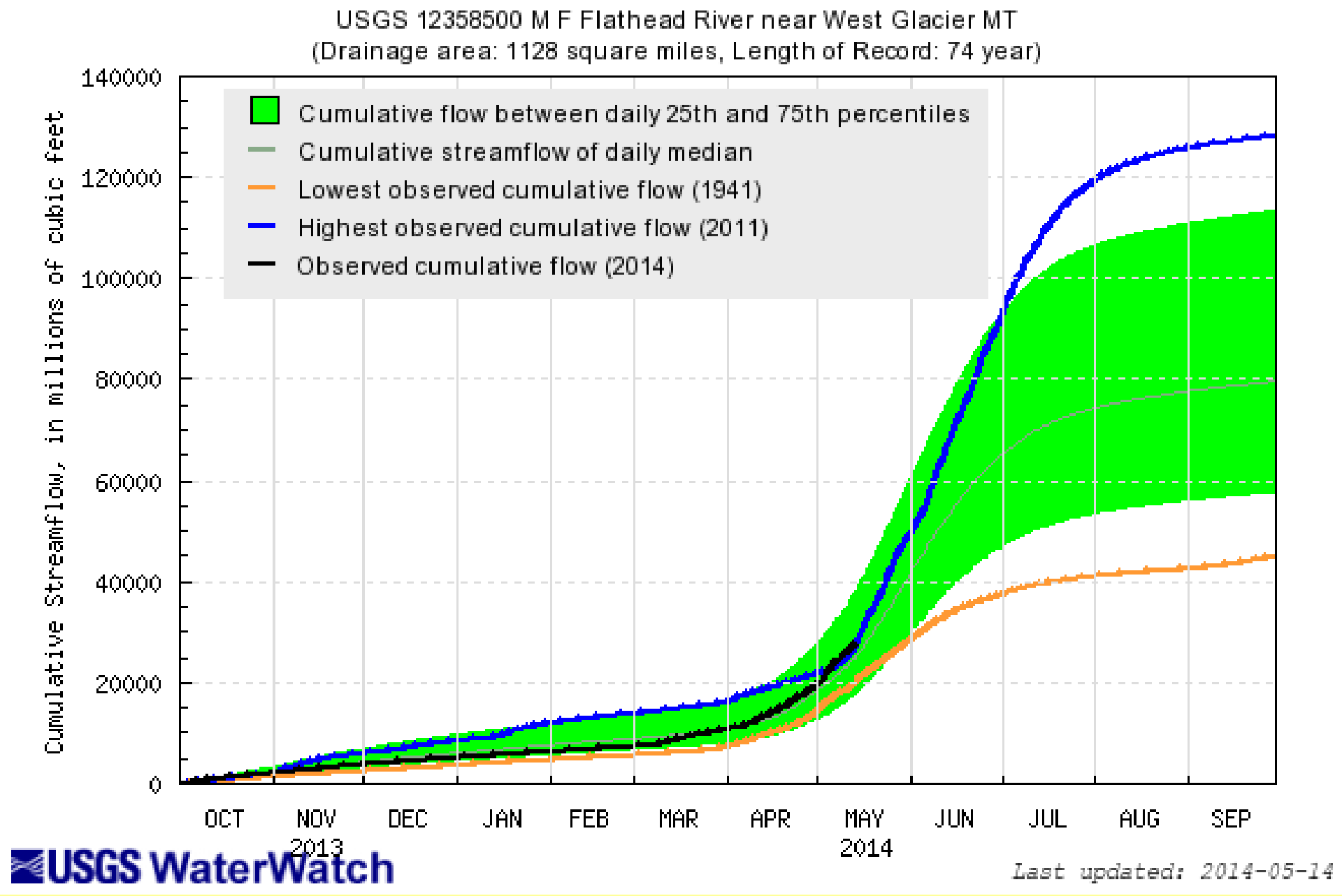
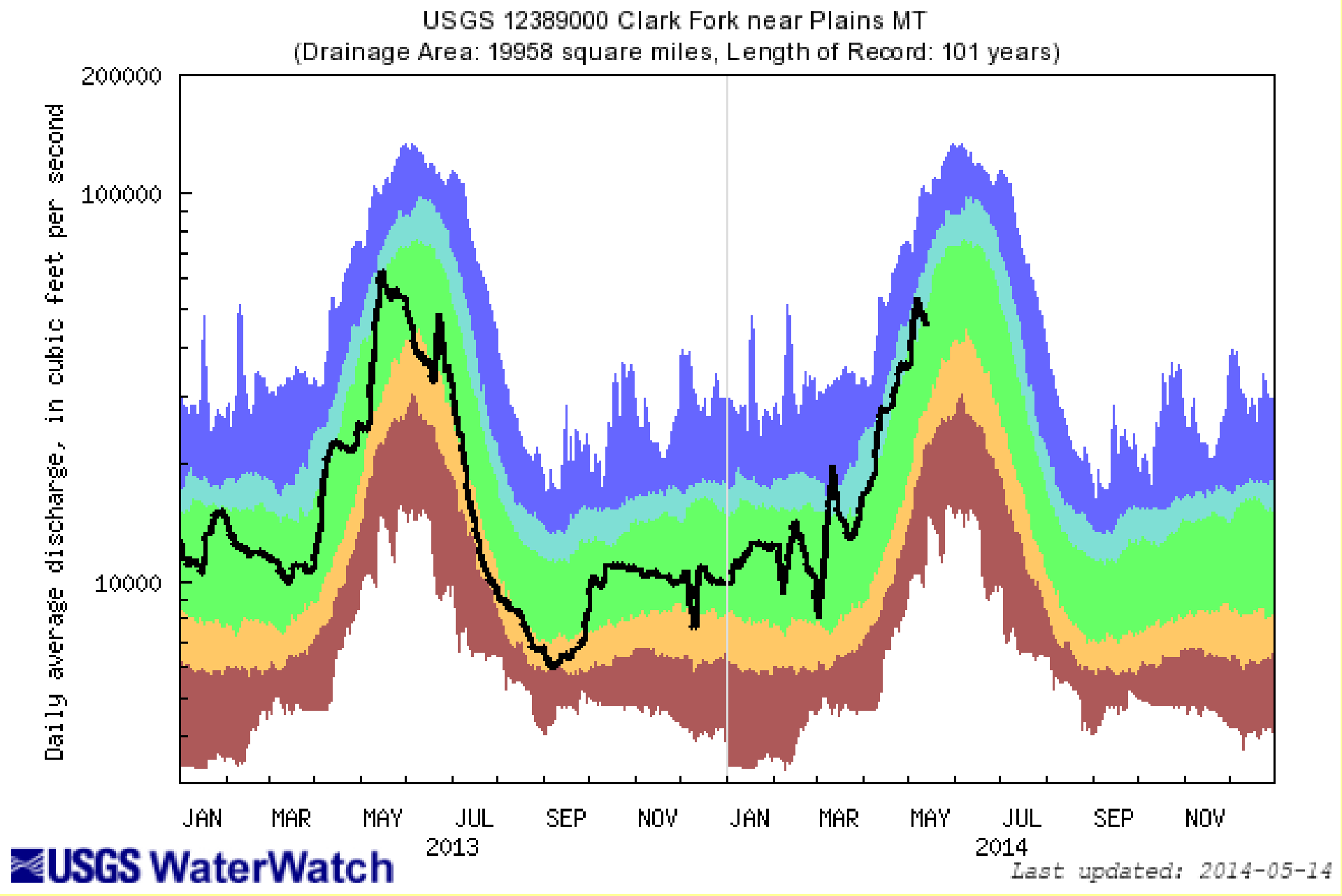
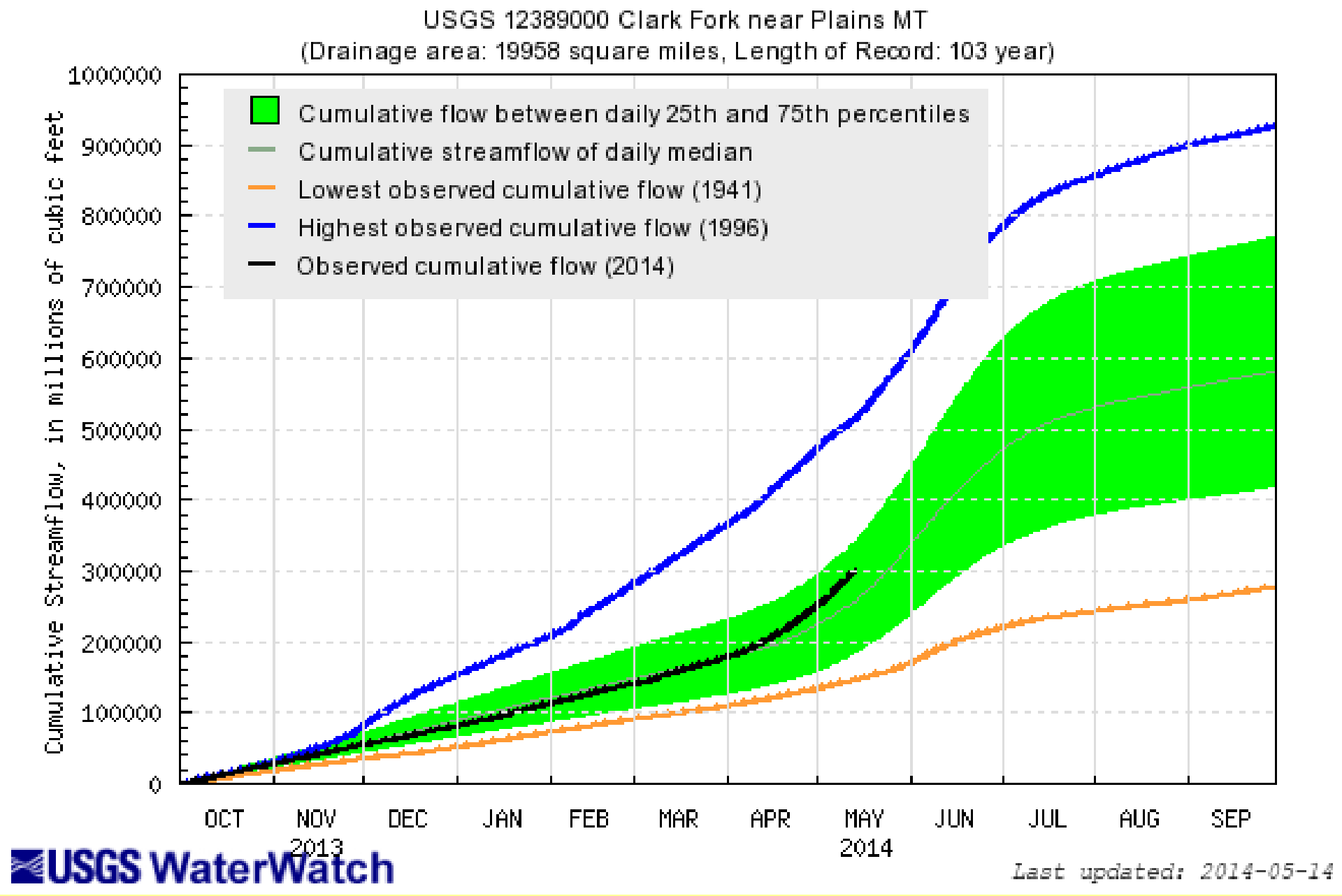

USGS 12358500 M F Flathead River near West Glacier MT
(Drainage Area: 1128 square miles, Length of Record: 73 years)
Daily average discharge, in cubic feet per second
100000
10000
1000
100
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal


USGS 12358500 M F Flathead River near West Glacier MT
(Drainage area: 1128 square miles, Length of Record: 74 year)
Cumulative flow between daily 25th and 75th percentiles
Cumulative streamflow of daily median
Lowest observed cumulative flow (1941)
Highest observed cumulative flow (2011)
Observed cumulative flow (2014)
Cumulative Streamflow, in millions of cubic feet
140000
120000
100000
80000
60000
40000
20000
0
OCT
NOV
2013
DEC
JAN
FEB
MAR
APR
MAY
2014
JUN
JUL
AUG
SEP
USGS WaterWatch
Last updated: 2014-05-14


USGS 12389000 Clark Fork near Plains MT
(Drainage Area: 19958 square miles, Length of Record: 101 years)
Daily average discharge, in cubic feet per second
200000
100000
10000
JAN
MAR
MAY
JUL
SEP
NOV
2013
2014
USGS WaterWatch
Last updated: 2014-05-14
Explanation - Percentile classes
lowest-10th percentile
10-24
25-75
76-90
90th percentile -highest
Flow
Much below normal
Below normal
Normal
Above normal
Much above normal



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Last updated: 2014-05-14

USGS Home Page: http://usgs.gov

NwisWeb: http://water.usgs.gov/mt/nwis
Access to streamflow (realtime and historical), water quality, and ground water information.

Montana District Home Page: http://mt.usgs.gov
Montana Current Streamflow Conditions